

1981 82
ANNUAL
REPORT

PLANT
INDUSTRY
DIVISION

Alberta



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Region I - Lethbridge	Mr. B.R. Shaw
Region II - Airdrie	Mr. L.J. Welsh
Region III - Red Deer	Mr. W. Jackson
Region IV - Vermilion	Mr. E.L. Treffrey
Region V - Barrhead	Mr. E. Lowe
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Supervisor - Animal Pests	Mr. C.F. Barrett
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SOILS BRANCH

Head	Mr. A.W. Goettel
Supervisor - Agrometeorology	Mr. C.D.W. Gietz
Supervisor - Soil Fertility	Mr. D.C. Penney
Supervisor - Soil Conservation	Mr. J.C. Hermans
Soil Specialist - Salinity - Lethbridge	Mr. H.S. Vander Pluym
Soil Specialist - Irrigated Crops - Lethbridge	Mr. R.H. McKenzie
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SOILS BRANCH

Soil and Feed Testing Laboratory

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WEED CONTROL AND FIELD SERVICES BRANCH

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Supervisor - Weed Control & Herbicides
Supervisor - Weed Research & Development
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Alberta Horticultural Research Center - Brooks

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Research Horticulturist - Market Garden Crops
Research Horticulturist - Greenhouse Crops
Head, Vegetable and Special Crops
Research Horticulturist - Vegetable Crops
Research Horticulturist - Greenhouse Energy Use
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Research Horticulturist - Plant Pathology
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Dr. R. Gaudiel
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Mr. T.R. Krahn
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Mr. R. Esau
Dr. U. Soehngen
Dr. R.J. Howard
Dr. P.O. Kharbanda
(until August 31)
Mr. S. Sumar
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Dr. G. Flores
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Mr. H. Ellis
Mr. E. Borkent

II. SUMMARY OF PROGRAMS

A. FIELD CROPS BRANCH

A 2 row feed barley and a 6 row feed barley were recommended for licensing from the Feed Grain Breeding Program. A third experimental variety, BT 506, was also recommended and will be withheld by us pending 1982 and 1983 malting trials. These two varieties were allocated to SeCan for Canadian distribution.

An extensive survey was conducted with 324 top producers as the prelude to the preparation of barley and canola production manuals in 1982-83.

Thirty-two production meetings attended by 1,400 farmers.

Twenty-nine municipal co-op seed cleaning plants were surveyed and 324 seed samples analyzed as an ongoing review of the quality of seed planted in Alberta.

A new seed plant was built at La Crete making a total of 76 plants serviced in Alberta.

Active involvement with the Canadian Seed Growers' Association continues. One area of activity is a major revision of the Seeds Act of Canada, which should be completed in 1982.

Special Crops, as cash crops, are more attractive when cereal prices decline. Bean acreage, sunflower and lentils increased, especially due to the opening or enlarging of processing plants in the Bow Island area.

Alfalfa seed production rose to a record 15,000 acres principally due to previous work in organizing the leafcutter bee pollinators. Alberta is now a net exporter of alfalfa seed.

An extensive study indicated the feasibility of 75 bushels per acre production of grain corn on dryland areas of southern Alberta.

Increased activity in forage production is favorably encouraged by 8 forage associations. A forage home study course was offered in Regions I and II.

The Society for Range Management held their conference in Calgary for the first time. Over 800 attended this week-long technical seminar.

The Forage Production Manual gained wide acceptance and was reprinted in 1981-82.

The decreased acreage of Canola has placed stress on processing plants which faced negative processing margins in 1981-82. The cost squeeze on farmers will demand a continued effort to extend methods of improved technology.

The drought which occurred in the eastern Peace River areas initiated a large Feed Freight Assistance Program which by March 31, 1982, had paid out \$2,240,000 to 2,681 producers.

Advisory services were provided to Olds College in the preparation of the Seeds and Grains Program which, when implemented, will provide the best training in seed technology and processing in Canada.

The guidelines for the Municipal Co-op Seed Cleaning Plants were totally revised and presented to the Minister.

Engineering was completed on seed plant design for modular plant construction. Detailed specifications should be available in the fall of 1982.

The 76 seed cleaning plants processed in excess of 28 million bushels of cereals and oilseeds. These plants deserve assistance to aid in the continued improvement of seed quality in the Province.

Responses have been received from our clients for even more technical help and a stable staff are well organized for such an effort.

B. CROP PROTECTION AND PEST CONTROL BRANCH

The Branch continued to provide a service for the protection of crops and livestock from insect, animal and plant disease pests. Branch staff conducted surveys of pests and damage, laboratory and field research on control measures, provided forecasts and updated information on pest control, and provided assistance through specialist staff, training and material to municipalities, farmers and the public. Most programs were carried out in co-operation with municipal agricultural service boards.

The Agricultural Pests Act 1974 with 10 regulations provided the basis for policies and programs to manage six declared pests: the Norway rat, warble fly, grasshopper, bacterial ring rot, fireblight, and Dutch elm disease; and three nuisances: the coyote, magpie and skunk.

The Act and regulations were administered on a provincial basis with training and certification provided to municipal officers responsible for local pest control. There was no revision of regulations during the year.

Pest problem and the use of pesticides and other control measures were reviewed and updated by various committees. The two main provincial co-ordinating committees were the Pest Control Advisory Committee (PCAC) and the Alberta Interdepartmental Committee on Pesticides (AICP). Dr. B. Bolwyn of the Alberta Environmental Centre served as secretary of the PCAC and the Branch Head served as secretary of the AICP. Branch staff served on various national, regional and provincial committees which provided liaison and co-ordination of programs and operations, as follows:

Canadian Association of Pesticide Control Officials
Expert Committee on Pesticide Use in Agriculture
Expert Committee on Grain Diseases
Expert Committee on Insect Pests of Animals
Western Committee on Livestock Pests
Western Committee on Crop Pests
Western Committee on Plant Disease Control
Western Committee on Vertebrate Pests
Agricultural Chemicals Advisory Committee
Problem Wildlife Committee
Central Rabies Control Committee
Potato Advisory Committee
Safe Food Committee
Apiculture/Entomology Advisory Committee (FFTF)
Expert Committee on Vertebrate Pests

Pest Control manuals/guides were prepared by the various committees and provided as references for department, municipal and other advisory personnel i.e. WCCP Guide on Crop Pests, WCLP Guide on Livestock Pests, WCPDC Guidelines for Plant Disease Control, PWC Problem Wildlife Management, etc. The guides were used to update publications and fact sheets for 1981 use by staff, farmers and the general public.

As arranged by agreement in 1979, the Pest Management Group, Alberta Environmental Centre, Vegreville continued to provide laboratory and applied research services for Alberta Agriculture and the farming community. AEC served as the main facility for regional laboratories, provided diagnostic services for north central Alberta, and handled all chemical damage investigations for the province. Surveys and field research were carried out for major plant diseases, insect, vertebrate and weed pests in co-operation with staff of the Plant Industry Division.

Dr. J.S. Horricks, Supervisor of Plant Pathology retired in June 1981 and was replaced by Dr. I.R. Evans. Ms. Sonja Korzan resigned as Branch Secretary in January 1982 and was replaced by Ms. Debbie Wallace.

Mr. B. Alexander resigned as Laboratory Technician, Seed Potato Improvement Program in October 1981 and was replaced by Mr. W. Davies. Ms. Lorna J. Peterson filled the new position of Laboratory Technician, Regional Crops Laboratory, Fairview in December 1981. During the latter part of the year, animal pest control was reorganized on a regional basis with Mr. P.H. Merrill working out of Lethbridge, Mr. J.B. Bourne at Vermilion and Mr. R.C. Acorn at Edmonton, as Regional Supervisors, Vertebrate Pests.

C. SOILS BRANCH

A diverse range of activities was carried out by branch staff in concert with the objective of providing Alberta's farming public with information and laboratory service designed to increase agricultural production and improve farm income. Increased activities resulted in personnel transfers and programs in a number of areas. Mr. Garry Coy started in early November as the first regional soil specialist, located at Fairview. Areas of emphasis include erosion prevention and control, and managing acid soils. Another area of increased emphasis is soil fertility of irrigated crop production. Mr. Ross McKenzie, a second regional soil specialist, commenced duties in Lethbridge in January, 1982. His major emphasis was on developing crop response data for soil test recommendations for irrigated crop production.

Reclamation of agricultural land following industrial or resource extraction activity gained increased attention. Branch staff continued to provide soils expertise to other departments involved in reclamation programs. A position has been approved for a soil reclamation specialist.

Mr. D.C. Penney was seconded by CIDA to a research project in Zambia. This provided an opportunity to retain Dr. Jim Robertson, of the Department of Soil Science, University of Alberta. Dr. Robertson's expertise and extension ability in soil fertility and liming was well appreciated.

D. WEED CONTROL AND FIELD SERVICES BRANCH

Emphasis was placed on staff training for both District Agriculturists and Agricultural Fieldmen, as the Branch attempted to change its role from one of reacting to requests for information and resources to one of actively preparing and promoting decentralized resources so these requests may be handled on a local basis. Development of computer assisted herbicide selection program software complements upgraded printed material. Preparation of extension aids such as slide-sound kits, handout material and display aided weed control extension.

Attention was directed toward upgrading the enforcement capabilities of Agricultural Fieldmen and also toward presenting a more balanced and factual viewpoint of the hazards associated with the use of pesticides.

Upgrading of our stored data base to provide for better decision making progressed internally through the establishment of a library of information and through inputs from our computerized Weed Alert program.

Concerted efforts to eradicate both Nodding Thistle and Diffuse and Spotted Knapweed were stepped up and some progress is evident.

E. HORTICULTURE

Alberta Tree Nursery & Horticulture Centre

- Production & Research Programs

To produce high quality trees in sufficient quantity to satisfy client needs. The nursery provides plant material for shelterbelt establishment, provincial parks revegetation and reclamation research and reforestation. Seed and material is supplied to the trade to aid in establishment of viable nursery operations in Alberta.

Research at the institution involved production related trials and demonstrations to aid the sod and nursery industry. Other research involves improving ornamentals available to Albertans for amenity plantings.

- Extension Services

To provide Albertans with horticultural information through courses, displays, radio and television shows and publications. This information is for commercial growers and amateur gardeners.

Alberta Horticultural Research Center, Brooks

The Alberta Horticultural Research Center (A.H.R.C.) is a branch of the Alberta Department of Agriculture. It is located at Brooks but has province wide responsibility for research and extension services in all facets of horticultural crops such as new crops or specialty crops grown under irrigation. The Research Center is one of nine test sites for prairie regional woody ornamental trials. Hardiness and performance of prairie-propagated material as well as culture, management and overwintering of container grown woody ornamentals is evaluated.

A major effort is in progress to improve and expand native fruit as well as small fruit crops in the province. Their potential for fresh and processed products is receiving active support and encouragement. The Center is one of three major sites for final evaluation of tree fruit for the prairies.

Production and management practices for greenhouse vegetable and floricultural crops were evaluated. Studies on alternate crops for greenhouse culture received attention in addition to hydroponic culture and energy conservation practices.

The vegetable program continued its emphasis on promoting early field production through improved seeding, cultural and management practices. This Center is a major co-operator in the prairie potato

breeding, and seedling evaluation program.

New and special crops as well as annual and perennial forage crops are being studied to expand and improve production.

In support of the production research programs, plant pests and disease control, weed control, storage studies as well as food processing and quality evaluation work is ongoing.

III. PROGRAM OBJECTIVES

ADMINISTRATION

- To provide an overview of policy making in the area of general agricultural and in the area of plant production in particular.
- To co-ordinate Divisional programs, to review and assess their compatibility with needs of the industry and with Government policy.

A. FIELD CROPS BRANCH

- To develop new high yielding, adapted lines of feed grain varieties for Alberta.
- To obtain performances and adaptability information on new and recommended cultivars of barley, wheat, oats, rapeseed and flax.
- To evaluate varieties of barley, wheat and triticale for possible high moisture grain production.
- To determine optimum grain moisture content for harvest of different varieties.
- To evaluate late seeding as a method of prolonging high moisture harvest.
- To develop new high yielding adapted lines of winter wheat, winter and spring triticale for south central Alberta.
- To obtain performance and adaptability information on perennial forage crops and to provide new production technology to maximize forage yields in central and southern Alberta.

- To study the economic and agronomic advantages of alternate crops in central Alberta and to obtain performance and adaptability information on possible alternate crops in order to make variety and production recommendations. To develop the agronomic technology necessary to produce viable seed from alternate field crops.
- To administer the Seed Dealer's Act of Alberta.
- To administer the guidelines for assistance to the Municipal Co-op Seed Cleaning Plants in Alberta.

B. CROP PROTECTION AND PEST CONTROL BRANCH

- To provide for the protection of crops and domestic animals from vertebrate, insect and plant disease pests, and to assist in the proper management of pesticides.
- To develop, promote and co-ordinate provincial programs in the inter-related fields of entomology/apiculture, zoology, botany and plant pathology with joint participation by municipalities in most activities, through applied research, extension and legislation.
- To administer the development and operation of regional crops laboratories, providing diagnostic and extension services at Olds and Fairview, and the seed potato improvement program at Olds, and to co-ordinate these activities with other sectors and the Alberta Environmental Centre, Vegreville.
- To provide provincial administration of the Agricultural Pests Act and 10 regulations for the control of six declared pests and three nuisances, with training and certification provided to municipal officers responsible for local pest control.

C. SOILS BRANCH

- To increase agricultural production and improve farm incomes by providing the farming public with information and laboratory services related to soil management, soil amendment and fertilizer use and climate, and by establishing applied research projects to solve soil problems involving erosion, fertility, salinity, acidity and soil structure.
- To encourage the wise and proper use and management of the agricultural soil resources of Alberta through education, applied research and legislation.
- To provide technical expertise and diagnostic capability of soil, plant and animal feeds to the agricultural industry.
- To provide technical expertise in meteorology as it relates to all agricultural activities.

D. WEED CONTROL AND FIELD SERVICES BRANCH

- To provide leadership and co-ordination of all weed control programs in the province. This includes municipal programs research, enforcement and direct action programs.
- To eradicate to control certain weed species known to be a hazard to agriculture, to prevent weed infestations from spreading and to disseminate information on weed control to farmers, industrial landowners, municipal authorities and others.
- To direct educational and training programs to District and Regional staff, Agricultural Fieldmen and weed inspectors to enable them to provide competent client services in weed identification, herbicide use, enforcement and control procedures.

- To provide information on pesticide use and hazard to the general public, the school system and our own staff with emphasis on proper use and safety and other precautions required to minimize the effect on the environment.
- To investigate weed problems, discover solutions and convey this information to farmers and extension workers. To provide state-of-the-art technology in weed control to Alberta farmers via established extension networks and innovative communication systems.

E. HORTICULTURE

ALBERTA TREE NURSERY AND HORTICULTURE CENTER

Administration

- To co-ordinate woody plant horticultural research and extension services by supervising the Alberta Tree Nursery and Horticulture Center. To administer the Provincial Shelterbelt Program, urban and amateur horticultural programs and special projects and programs as required.
- To provide consultative assistance to other sectors of the Department, to other government agencies including federal agencies and horticultural industries.

Alberta Horticultural Research Center

- To provide applied research and development expertise and extension information to all parts of the horticultural industry in the province, and to provide horticultural and special crops advice within Alberta Agriculture and to commercial growers and amateur horticulturists.
- To provide applied research and extension services in new and specialty crops grown under irrigation.

- To provide plant diagnostic and extension service to the southern part of Alberta through the Regional Crops Laboratory at Brooks.
- To administer the Alberta Vegetable Sales Act, Urban and amateur horticultural programs and special projects.
- To provide assistance to other sectors of the Department, to other government agencies and the horticultural industries.

IV. PROGRAM ACTIVITIES

A. FIELD CROPS BRANCH

CEREAL AND OILSEED CROPS SECTION

An early spring following a dry fall and winter resulted in early crops being sown into relatively dry seedbeds. The western half of the province to the north of Edmonton and southern Alberta to east of Lethbridge received generous rains. The Peace River block and the eastern side of the province remained dry. The dry seedbeds resulted in uneven germination and some reseeding, especially in canola crops.

The Olds College established a Seeds and Grain Program Advisory Committee to develop a major in-depth educational program for personnel in the seeds and grain industry. The program will offer one year certificates in seed conditioning (seed cleaning plant management) and elevator management and two year diplomas in grain inspection and seed analysis. The first annual Seed and Field Technology Workshop was held at Olds College in June to provide people in the seed industry with the latest technology.

Three hundred and twenty-four top farmers in west and north central Alberta were questioned on their production practices in barley and canola. The information was sorted by yield and rainfall. Management factors contributing to high yields will be incorporated into a Barley Production Manual and a Canola Production Manual.

Pedigreed Seed

Alberta Stock Seed Distribution Committee allotted 1,502 kg. of cereal and oilseed breeder seed to 69 select and probation growers. In addition, the Stock Seed Committee approved 12 probation growers allowing them to obtain breeder seed from SeCan.

SeCan Association membership increased to 1,400 members from 850 a year earlier. Two hundred and fifty members were from Alberta compared

to about 105 the year previous. SeCan had 70 varieties under its control compared to 54 varieties in 1980.

The Branch provided a co-ordinating role for the Alberta Branch - Canadian Seed Growers' Association. In 1981, 1,096 Alberta seed growers had 79,000 hectares inspected.

The Alberta Branch hosted two important conventions in 1981, the National C.S.G.A. Convention and the Inter-Provincial C.S.G.A. - Western Seed Trade Association Convention. Two probation growers workshops were held in 1981. The Branch assisted in placing and manning seed displays at numerous fairs and seminars.

The Alberta Branch was instrumental in encouraging the furtherance of the seed technology course at Olds College. Also, revisions to the Seed Standards Act were encouraged by the Alberta Branch.

OILSEED CROPS

Canola crops in 1981 declined from 2.2 million acres in 1980 to 1.55 million acres. 87% of the acreage was sown to canola varieties compared to 78% in 1980. Emphasis was placed on the necessity of changing to canola varieties. The five crushing plants in Alberta processed only canola seed in 1981 with few problems occurring from contamination from the older rapeseed varieties.

Close liaison was maintained with oilseed commodity organizations, crushers and exporters to provide resource information and to help facilitate communications within those industries. Two Alberta Canola Industry Meetings were held to discuss the common concerns of the crushers, grain handlers and producers. Resource information was provided to 32 production meetings and seminars throughout the province.

Input was provided to glucosinolate standards establishment and a standard was adopted for foundation seed of canola varieties at 2.8 mg/g.

A major sclerotinia control project was carried out by District Agriculturists, Agricultural Service Boards and Regional Plant Industry Supervisors on 15 field sites throughout central Alberta. The results indicated very good control of sclerotinia with the use of Benlate - a fungicide from DuPont and Rovral - an experimental fungicide from May and Baker. Very good yield increases ranging from 4 to 25 bushels per acre occurred with Altex, while in Candle the fungicides controlled the disease but did not increase yield.

Close liaison was maintained with Agriculture Canada and University researchers working on oilseed crops. Numerous press, radio and T.V. releases and interviews were prepared and material assembled for regional, district staff, educational institutes and commodity groups. This promoted the early adoption of relevant technology by producers for efficient production.

CEREAL CROPS

Assistance was given to Regional staff, District Agriculturists and Agricultural Service Boards in setting out plots for promotion and demonstration. The plots related to cereal varieties and high moisture barley.

Programs

Seed Analysis Program - 324 seed samples were collected from 29 Co-op seed cleaning plants. These samples were analyzed and graded according to the Canada Seeds Act Standards and against a standard which equalled one-half the allowable number of contaminants under the Canada Seeds Act. The results showed that Alberta's Co-op Seed Plants have the ability to clean farmers' grain, of the principal cereal crops, to a much higher standard than that required by the Canada Seeds Act.

Municipal Seed Cleaning Plants - Seventy-six Alberta Municipal Co-operative Seed Cleaning Plants processed 28.8 million bushels of cereal grain and oilseeds for the year ending June 30, 1981. This is up 2.1 million bushels from last year and set a new record cleaning year.

<u>General Summary (Bushels)</u>	<u>1981</u>
Total cleaned commercial seed	25,162,912
Total cleaned for pedigreed seed	891,115
Total cleaned for seed	26,054,027
Total cleaned for dockage removal	2,788,489
Total processed	28,842,516
 Average grain processed per plant	 379,507

The Upgrading Program grant applications numbered 27 totalling \$728,837.58 of expenditure by the plants and \$186,951.99 worth of Provincial grant money in the 1981-82 fiscal year. This compares to 23 grant applications totalling \$548,260.54 of expenditure \$153,728.26 worth of provincial grant money one year ago. The average grant paid in 1981 was \$6,924.15 compared to \$6,683.84 last year.

A new Co-op Seed Plant was built at La Crete costing approximately \$460,000.00. The St. Paul plant was destroyed by fire and is currently being replaced for a cost of approximately \$1,124,000.00

1982 BREEDER SEED ORDER - SUMMARY OF SEED ORDERED

	<u>Total Order</u>	<u>Variety</u>	<u>Number Orders</u>
<u>BARLEY</u>	<u>1,156 kg.</u>		<u>44</u>
	17	Melvin	1
	17	Klages	1
	34	Herta	1
	34	Betzes	1
	68	Conquest	3
	204	Bonanza	9
	238	Klondike	9
	34	Hector	1
	51	Galt	2
	17	Fairfield	1
	442	Otal	15
<u>DURUM WHEAT</u>	<u>51 kg.</u>		<u>2</u>
	17	Wakooma	1
	34	Wascana	1
<u>WHEAT</u>	<u>255 kg.</u>		<u>11</u>
	68	Norstar	2
	102	Neepawa	4
	17	Park	1
	34	Fielder	2
	17	Garnet	1
	17	Pitic 62	1
<u>RAPESEED</u>	<u>40 kg.</u>		<u>12</u>
	18	Candle	6
	17	Regent	5
	5	Tower	1

FIELD CROPS RESEARCH

In contrast to our 1980-81 season, 1981-82 saw almost a complete recovery from the disastrous hail storm of the previous year. The breeding program is back on target and several projects have been completed. The full time staff has been extremely stable this year with only one position vacated in technical ranks. There are now 18 full time positions working in Research.

Work has proceeded well on the Research Farm Development with completion scheduled for 1982.

Three barley varieties were approved for licensing in February, 1982, by the Expert Committee of Grain Breeding, Grain Diseases and Grain Quality. Two of these lines were released to seed growers through SeCan. This spring the remaining line will be market tested for two years with the Malting and Brewing Industry before release.

TR 604, Abee, is a two row feed variety which has been the highest yielding two row variety across Canada. Abee has already become the official two row high yielding standard check variety for the National Co-op Testing Program. While primarily adapted to Alberta this variety may find acceptance throughout Canada.

BT 507, Empress, is a six row feed variety which has shown outstanding yield as a high moisture grain variety and a silage variety in Central Alberta. These two varieties meet at least half of our original objectives for the breeding program set down in 1973.

BT 506 is a six row malting variety aimed at replacing the Bonanza malting acreage in Alberta. Extensive quality testing will be carried out in 1982 and industrial trials are scheduled for 1983. This variety is earlier than Bonanza by an average of two days and has larger kernels, stronger straw, better disease resistance and 7% higher yield in areas II and III of Alberta.

Several new lines remain in first, second and third years of the Co-op for possible license in future years. The licensing of new varieties by the Crop Research Section has entered Alberta Agriculture into a new phase of research. The total ramifications of this event will not be known for at least another five years.

In addition to the success in the Breeding Program, a research report on High Moisture Grain Production has been completed with release to all Plant Industry and District Agriculture Field Staff scheduled for June 1982. While research will continue in this area, this report marks the end of this project as originally defined. We feel that the success of the new variety, Empress, should assist producers of high moisture grain to maximize yields and quality in the coming years.

A more detailed report on the Feed Grain Breeding Program, the Cereal and Oilseed Variety Testing Program, the High Moisture Grain Program and the Special Crops Program is on file in the Field Crops Library in Lacombe.

FORAGE AND SPECIAL CROPS SECTION

The Forage Section has outlined a program to improve the extension thrust of Forages and Special Crops. Forage problems were identified and allocation of manpower designated to accomplish the job. A forage specialist will be employed for the east-central and northeast regions of the province. Producer interest in improved forage management is increasing as shown by a high demand for public meetings.

Historical

The weather has been unfavorable for forage production, both hay and range, in east-central and northeast Alberta over the past two seasons. The unfortunate lack of rainfall and the long cold winter necessitated the largest feed freight program ever experienced in recent years. Fortunately, other areas of Alberta had reserves to accommodate the feed shortage.

Special crop production increased. Examples include grain corn, confectionary sunflowers and field beans. Nineteen eighty-one pea and sugar beet yields were among the highest ever.

People Oriented Programs

Forage associations remained active with one new association, the North Peace, being formed. All associations were increasingly involved in improved forage management systems, especially tame pastures. The Pembina Forage Association, for example, produced over 300 kg. of beef/hectare and demonstrated a profit balance with relatively high input costs.

The Pembina Forage Association collaborated with Alberta Agriculture Personnel and Vertec Industries Ltd. in the development and testing of a Forage Seed Harvester capable of harvesting meadow foxtail.

A Pulse Growers' Association developed to carry out promotional and extension research programs. The Alberta Corn Committee is expanding into dryland corn, corn handling, varietal testing, etc.

Forage Home Study Course in Regions I and II

Approximately 750 applicants registered for the course. Local seminars and four large meetings were well attended.

RESEARCH AND DEMONSTRATION

Forage varieties and species were tested in different regions of the province to keep growers up-to-date on regional yields. Management and agronomic data was also collected. Pasture demonstrations included fertility trials, grazing systems and stocking rates.

Increased interest has been developed on use of legume plowdown and the benefits in rotations on fertility and soil structure.

Chinese seeds of several crops have been received by the Field

Crops Branch and have been allocated for production trials in various areas of the province.

Grazing trials comparing beef production from native range and Russian wild rye have been completed. Statistical results will be published in 1982.

A demonstration trial on production and handling of fiber flax on irrigated land in southern Alberta was stimulated by interest from private industry.

Activities in Region V Included the Following

1. The third and final year of a Forage Quality Study in co-operation with the University of Alberta was carried out.
2. Micro-Nutrient study for forage crops in conjunction with Animal Industry Staff and co-operating District Agriculturists.
3. Assist in the supervision and field testing of Meadow Foxtail Seed Harvester. Tests on 13 fields provided very positive results and modifications to the machine.
4. Conducted a K-Hay project on alfalfa and red clover in conjunction with Dr. Ed Redshaw, Plant Physiologist, Soil and Feed Testing Laboratory.
5. Alfalfa survey completed in Northwest Region in conjunction with Dr. Jim McKenzie, Beaverlodge C.D.A. Research Station.
6. Forage species demonstration plots were established in six District Agriculturist's districts.

FORAGE CROPS SECTION

Forage Association activities remained high. Other extension demands were high, especially public meetings regarding alfalfa production and tame pasture management.

Canadian Forage Seed Project's total foundation seed applications were reduced to about one-half of 1980. The greatest reductions were in alfalfa and timothy with alsike and red clover seed demand remaining low. This reflects surpluses and low prices in many common species and varieties.

RANGE MANAGEMENT

Native ranges continued to be over-grazed, especially in areas where precipitation was below normal. More water facilities and rotational grazing would improve this situation.

The Range Improvement Program has been modified with new guidelines. The new title, Soil and Range Improvement, will extend the program to benefit more farmers.

SPECIAL CROPS SECTION

Special crop acreage expanded moderately in 1981 in response to alternate crop usage and lower dollar returns for traditional crops. Change in management attitude, and maintaining that change, profited many growers.

Three new special crop contractors established businesses in Alberta in 1981-82, bringing the number of contractors to 13.

An increase in requests for special crop demonstrations was experienced in 1981. Crop kinds in demand were lentils, fababeans,

peas, corn, triticale, fiber flax, canary seed, sunflowers, sorghum and soybeans.

Because of the continual demand for information on new crops, 32 seminars were arranged during the year to provide this information to prospective producers. Many producers are viewing alternate crops on the basis of increased farm cash flow by contract production. The nitrogen fixation potential of legume special crops has also been a criteria for producers to use these crops.

Alfalfa seed production using leafcutter bees gained more ground in 1981. Twelve thousand acres of pedigreed alfalfa were inspected for certified production.

Technology transfer programs expanded to include corn, sunflowers, dry beans, canary seed, triticale, lentils, fiber flax, dry peas and soybeans.

There were numerous winter meetings and in-staff training sessions.

Consulting reports were made on the agronomics of sunflowers in Alberta.

B. CROP PROTECTION AND PEST CONTROL BRANCH

CROP INSECTS

Grasshoppers

Grasshopper populations increased in north-eastern Alberta causing damage throughout the area extending from Provost through Wainwright, St. Paul, and Lac La Biche over to Wandering River, Athabasca and Smith. Approximately 12,000 acres of forage crops and pasture land were sprayed in this area to control severe grasshopper infestation. The accompanying 1981 grasshopper forecast map did not include the northern portion of the infested area but this was included in the fall survey. The department distributed 2,600 gallons of dimethoate insecticide to municipalities and farmers for control of grasshoppers and other pests including lygus bugs, forest tent caterpillars and shelterbelt pests. The Grasshopper Control Policy 1981 and the colored Grasshopper Forecast Map 1981 were distributed to district and municipal offices as well as grain elevator agents. The department continued toward the objective of phasing out as main supplier of grasshopper insecticides as reserve stocks were used up and the chemical trade ensured supplies were available.

Canola Pests

Flea beetles were a less severe problem, but many fields especially in the Peace region, although damaged by seedling blight, were sprayed because flea beetles were considered responsible for the damage. Maggots and lygus bugs were widespread in canola fields. The significance of both pests is unknown in canola and will be studied over the next few years. Approximately 30,000 acres of canola in the Vulcan, Blackie, Strathmore areas were sprayed with Lannate to control Bertha armyworm. Another 900 acres of canola were sprayed in the Eaglesham area of the Peace region. Industry supplied control products and is gearing up to supply insecticides as populations increase. The province wide pheromone trapping system proved effective in southern Alberta but did not detect armyworm in the Peace region. Research will continue to improve this early-warning-system in co-operation with Alberta

ALBERTA GRASSHOPPER FORECAST

1981



Normal



Light



Moderate



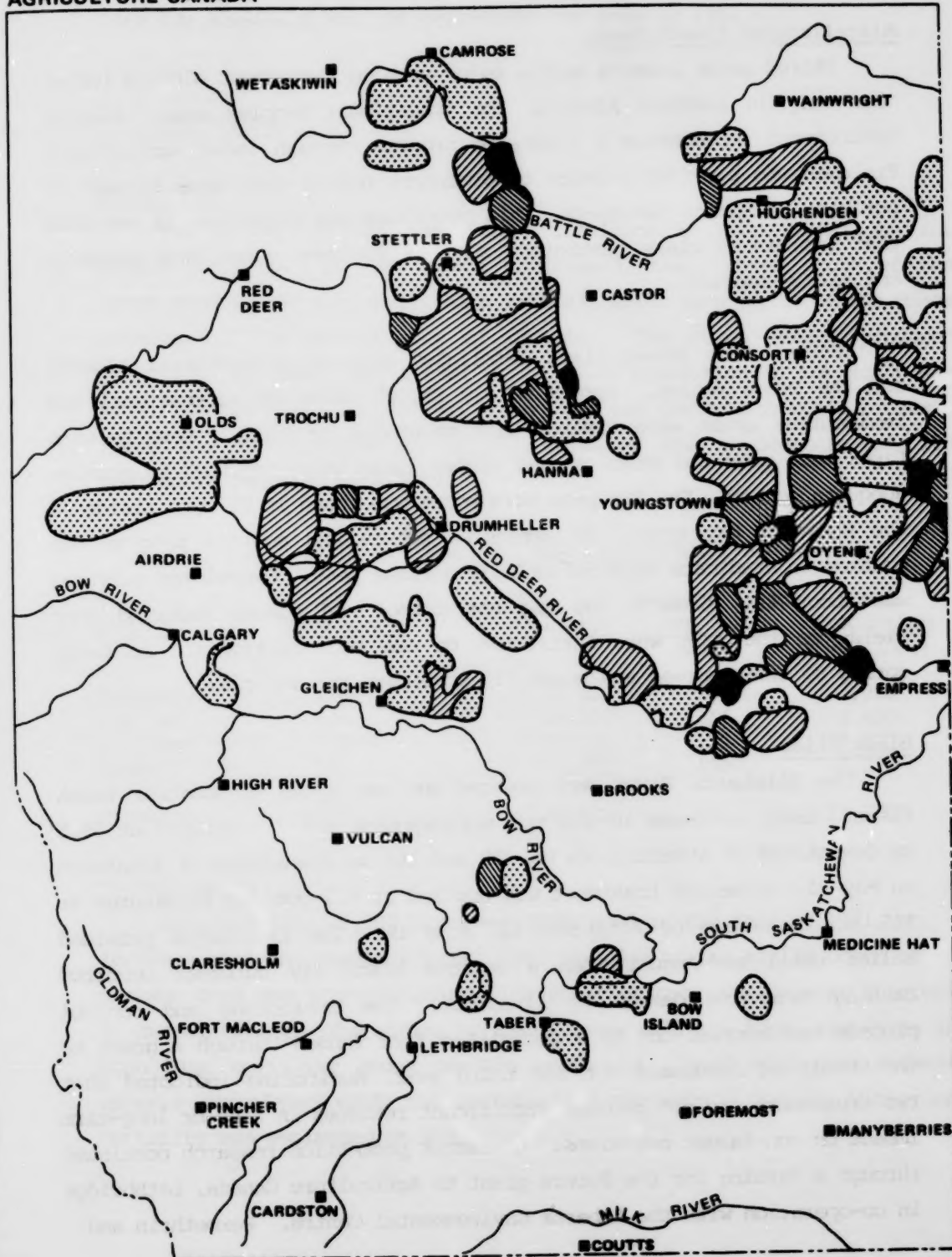
Severe



Very Severe

0 40 80 km

AGRICULTURE CANADA



producers.

Miscellaneous Insect Pests

Stored grain insects were a major problem throughout Alberta rather than only in southern Alberta, the traditional problem area. Alberta Environment implemented a licensing program through local Agricultural Fieldmen who provided permits to producers before they were allowed to purchase phosphine fumigants. This procedure was effective in ensuring that restricted class pesticides such as fumigant gases were properly and safely applied.

Forest tent caterpillars defoliated most of west-central Alberta and the Peace region. Approximately 15,000 acres of recreational and residential areas were treated with malathion or Dipel. Results with Dipel were poor and tests showed higher rates were required to provide adequate control. The European corn borer was found in 21 corn fields in the Medicine Hat area. An extensive survey and control program was mounted to eradicate this potentially serious pest. Overwinter survival was about 80%. Growers who had not disced and plowed infested corn fields in the fall were instructed to use such cultivation in early spring to limit spread and hopefully eradicate the outbreak.

Black Flies

The Athabasca River was treated at two sites to control black flies, using a dosage of 0.3 ppm methoxychlor for 7.5 minutes at 59.5 km downstream of Athabasca on May 20 and 160 km downstream of Athabasca on May 21. A second treatment was applied at 0.2 ppm for 15 minutes at 145 km downstream of Athabasca on June 19. The treatments provided relief until mid-August when a serious black fly outbreak occurred causing extensive damage to livestock. The monitoring and control program was carried out by a consulting firm funded through a grant to the County of Athabasca for the third year. Monitoring indicated that two treatments did not produce significant residues in fish or long-term impact on non-target organisms. Livestock protection research continued through a Farming for the Future grant to Agriculture Canada, Lethbridge in co-operation with the Alberta Environmental Centre. Permethrin and

fenvalerate insecticides both provided livestock protection for 10-12 days and hopefully will be registered for sale in 1982.

APICULTURE

Honey Crop

The spring of 1981 was early, resulting in good conditions for spring build-up. As the season progressed, the regions south of the Peace experienced abnormally high rainfall while many parts of the Peace experienced the second year of drought. The Peace region produced significantly lower than normal crops while production in the South was significantly higher. The 1981 honey crop was one of Alberta's biggest. There was an increase of 10,000 colonies and a decrease of 100 beekeepers compared with 1980.

TABLE 1. ALBERTA HONEY PRODUCTION 1981

<u>Region</u>	<u>Beekeepers</u>	<u>Colonies</u>	<u>Average Yields Per Colony (lbs.)</u>	<u>Total Production ('000 lbs.)</u>
Southern	130	16,000	181	2,900
Central	530	17,000	144	2,450
Northern	850	73,000	129	9,430
Peace	190	64,000	130	8,320
Province	1700	170,000	136	23,100

Overwintering

Approximately 40,000 hives were wintered in the fall of 1981, an increase over the previous year. This was due to the rising costs of package bees and transportation, low sugar prices, and general interest in overwintering. The winter of 1981-82 was cold and long, resulting in high hive mortality among certain producers. Good wintering success appears correlated with the operator's experience. Overall wintering mortality was estimated at 20%.

Inspection Service/Disease Statistics

American Foulbrood disease (AFB) continued to be a problem for beekeepers in Alberta, but the incidence decreased considerably over 1980. (Table 2.) Fifteen seasonal inspectors were employed and 3 were retained on a contract basis over the fall and winter to handle emergency inspections. In 1981, 22,837 brood frames were removed from AFB infected colonies and destroyed.

TABLE 2. DISEASE STATISTICS

	<u>1980</u>	<u>1981</u>
Beekeeper Contacts	661	575
Colonies Inspected	16903	17449
Colonies AFB	4902 (29%)	3028 (17%)
EFB (% Colonies)		.5%
Chalkbrood		11%
Sacbrood		4%

Ethylene Oxide Fumigation Chamber

The ETO chamber designed and built for the Alberta Beekeeper's Association (ABA) was turned over to Alberta Agriculture in November. Difficulties were experienced in the mechanical operation and in procuring a federal experimental use permit for testing ETO for AFB control in beehive equipment. A permit was obtained in the spring of 1982 and further testing will be considered for the fall.

Pesticide Problems

Limited bee kills were reported during the aerial spraying of forest tent caterpillars in the Sherwood Park area. Heavier losses of approximately 100 - 125 colonies were reported north of St. Paul due to grasshopper control insecticide applications.

Extension Activities

The Apiculture Newsletter was published four times during the fiscal year, reaching every registered beekeeper. Twelve beekeeping management evening courses were held during March 1982 and a one day short course on Financial Management For the Beekeeper was co-sponsored by the ABA. Field days were held at Beaverlodge and Olds in June 1981.

and an overwintering field day was held at St. Vincent in March 1982. A beekeeper's production manual has been prepared and should be published by late 1982. A diagnostic manual for the recognition of bee diseases is in progress.

Co-operative Demonstration Projects

Seventeen beekeepers cooperated in demonstration projects during the 1981 beekeeping season. These included projects on double queen management, queen rearing, scale hive data collection, pollen collection and the use of herring meal as a spring pollen supplement.

Intradepartmental Projects

A cost analysis study comparing overwintering and package bee operations, in co-operation with the Regional Economics and Business Services Branch, Fairview, is near completion. A study analyzing honeyhouse design equipment and materials handling in the apiary and honeyhouse was undertaken in the summer of 1981. The study involves departmental engineering staff, the ABA and Apiculture staff.

Other Activities

A series of bee sting allergy clinics were arranged in cooperation with Dr. James Day, allergy specialist carrying out research on the incidence of anaphylactic reactions among Alberta's beekeeping families. Dr. Day is funded under Alberta's Farming for the Future Program.

Alberta's beekeepers are now eligible for crop insurance under the Alberta Hail and Crop Insurance Corporation. This is the first honey crop insurance plan in Canada and possibly North America.

Bear damage to beehives was light in 1981 with few claims under the Bear Damage Compensation Program. The Program was revised in 1981 to reflect the rate of inflation and the method of inspection modified to allow beekeepers to salvage damaged hives.

Concerns Facing the Industry

The potential threat of the exotic parasitic mites Acarapis woodi and Varroa jacobsoni as well as the migratory Africanized bees of South America are of concern. As there are no natural barriers preventing their entry into the U.S., the Canadian industry will eventually be affected by these pests and undesirable genetic stock if we continue to import U.S. package bees. Research and extension activities are currently aimed at future self-sufficiency in Alberta and the rest of Canada in light of these problems. Increasing costs of package bee operations are also forcing beekeepers to seriously consider overwintering as an alternative.

There is concern over the vast amounts of honey held by the U.S. government in their honey support program. As the U.S. government pays higher than market value for honey, beekeepers and honey packers place honey in the program and then purchase cheaper foreign honey. This has led to lobbying for U.S. tariffs on imported honey which could hurt the Canadian industry as we export about 20 million pounds to the U.S. annually. At present there is a surplus of Canadian honey on hand and consumer resistance to purchase at current prices. Projections are that the wholesale price to the producer will drop in 1982.

PLANT DISEASES

Cereal Crops

In spite of a dry spring, crop yields were generally good and quality was high. Root rot was common on barley in central Alberta and coupled with very hot weather in August the grain did not fill out as anticipated. Septoria glume blotch was severe in scattered fields of wheat in the Vegreville area. Head melanosis (black chaff) caused heavy losses on Park wheat in the west central areas of the province and occurred sporadically on other varieties. It was severe only on Park and Thatcher wheats and Neepawa appears to be highly resistant to this disease.

Oilseed Crops

Seedling blight of canola, primarily caused by Rhizoctonia solani, caused complete stand losses in particular in the Peace region and east central Alberta. The damage was early enough in the season to allow reseeding with either canola or barley. A high incidence of root maggots in the west central region was referred to entomologists for further examination.

A provincial survey of canola did not turn up any plants with the virulent strain of blackleg, despite the continued high incidence of this disease in Saskatchewan.

Field scale trials on fungicidal control of Sclerotinia stem rot of canola, in a co-operative effort with a number of agencies and companies, showed excellent results. Benlate, a registered fungicide gave yield increases of more than 100% in Argentine canola. Similar trials with Polish canola gave significant disease control but no appreciable yield increases. Testing will be continued in 1982.

Forage Crops

Verticillium wilt of alfalfa was found in 22 fields in southern Alberta, up from 5 fields in 1980. All infested fields were in irrigation areas. The source of infection for these fields was considered to come from seed imported from the U.S. Fact sheets and information packages were prepared on verticillium wilt for distribution to growers. An intensive survey and control program in the irrigation areas of the province is underway to eradicate the disease or at least to limit its spread until resistant varieties are developed.

Bacterial Ring Rot

The BRR control program was operated with the cooperation of seven municipalities funded through department grants. These grants were substantially increased in 1981, to cover the rate of inflation since 1976. The incidence of the disease was up in the M.D. of Taber, the Lethbridge and Edmonton perimeter areas, and regions 4 and 5 but remained the same or lower for the rest of the province. The increase

may have been related to ideal inspection conditions during the fall survey. No BRR was found in pedigreed seed fields. The supply of Alberta grown seed of the major cultivars should be sufficient for 1982 planting, with the exception of Norchip stocks required for the processing industry.

TABLE 1. POTATO ACREAGE AND INCIDENCE OF BACTERIAL RING ROT IN 1981

<u>District</u>	<u>No. of Farms</u>		<u>Acreage</u>		<u>% Infested</u>	
	<u>Inspected</u>	<u>Infested</u>	<u>Inspected</u>	<u>Infested</u>	<u>Farms</u>	<u>Acreage</u>
Peace River area	7	1	157	30	14.3	19.1
M.D. Sturgeon	14	3	1200	143	21.5	11.9
County Parkland	3	0	865	0	0.0	0.0
Edmonton area	7	3	188	28	42.9	14.9
Barrhead area	7	2	175	25	28.6	14.3
Vermilion area	9	2	270	29	22.2	10.7
Red Deer area	17	0	607	0	0.0	0.0
Calgary area	18	1	111	8	5.6	7.2
County Newell	25	9	2311	389	36.0	16.8
I.D. 1 & 2	3	0	60	0	0.0	0.0
M.D. Taber	37	15	9319	2300	40.5	24.7
County Forth Mile	7	0	387	0	0.0	0.0
County Lethbridge	9	0	291	0	0.0	0.0
Lethbr. perimeter	29	5	502	252	17.2	50.2
TOTALS:	192	41	16,443	3,204	21.3	19.5
1978-81 Average:	201.3	39.0	15,877	2,042	19.4	12.8

Of 192 potato farms inspected, involving 16,443 acres, 21.3% of the farms and 19.5% of the acreage were infested with BRR. The 4 year average (1978-81) is 19.4% of the farms and 12.8% of the acreage infested. The incidence of BRR was marginally higher than the 4 year average (Table 1).

Regulatory and Policy

The Bacterial Ring Rot Review Board received no applications for appeals in 1981. The seven municipalities continued to cooperate well in the program and were pleased with the increase in their grants. At a meeting held in December at Lethbridge it was unanimously agreed by the Alberta Potato Commission and the department to continue the BRR program and maintain the Review Board for another three years.

The 12.8% infested figure on the commercial potato acreage usually refers to a trace occurrence of this disease in the crop. Rarely are there any fields with more than 1% infested plants. In essence BRR is not causing any appreciable economic loss in the crop as was the case 10 to 20 years ago. Nevertheless constant vigilance must be maintained to keep the incidence of this pest to a minimum and eventually lead to total eradication. Elsewhere in Canada, the presence of BRR in seed potatoes has created considerable concern among provincial and federal agencies. In Alberta BRR was not found on any of the 1600 acres grown for seed. Several provinces have made initial enquiries about the possibility of emulating Alberta's BRR control and disease-free seed programs.

Ornamentals

Dutch elm disease or its beetle vectors were again not found in Alberta following surveys concentrated in the south of the province. This disease was positively identified for the first time in Saskatchewan, on a single tree in Regina. It is well established in Manitoba and Montana. Activities were coordinated with staff of forestry, parks and horticultural agencies to maintain our freedom from DED.

The incidence of fireblight was lower than in previous years though there were specific instances, despite the dry spring, where the damage was severe. It was also obvious that silver leaf, a wood infecting fungus disease, winter injury, flooding, soil salinity and other environmental conditions were being recognized as such and not blanket-labelled as fireblight. Training courses have helped people in field diagnosis of fireblight and other abnormalities and diseases.

REGIONAL CROPS LABORATORIES

Fairview Laboratory

The regional crops laboratory provided a diagnostic, survey and extension service for Region VI. Laboratory staff conducted applied

research projects, disease and insect surveys, and field investigations. A total of 427 specimens were processed, an increase of 10% over last year. (See Table 2).

Entomology. Insect surveys for lygus species in alfalfa and rapeseed indicated an increase in the numbers of these pests. Control of lygus species in alfalfa seed fields has been shown to result in significant seed yield increases. Bertha armyworm was surveyed with pheromone traps at 39 sites. Although moth catches were low, approximately 1,000 acres were sprayed with insecticide. Root maggots caused damage to 26% of the plants in 80 fields of canola surveyed but the effect on yield needs further examination.

TABLE 2. SUMMARY OF SPECIMENS SUBMITTED TO THE REGIONAL CROPS
LABORATORY-FAIRVIEW, 1981-82

Crop	# Disease Specimens	% Total	# Insect Specimens	% Total
Field Crops	95	31	17	14
Ornamentals	82	27	16	13
Shelterbelts	23	7	13	11
Vegetables	29	9	6	5
Fruits	20	6	5	4
Miscellaneous	60	20	63	53
TOTAL	309		120	

Plant Pathology. Damping-off or seedling blight of canola was a serious problem; early seeding into cool dry soil resulted in 100% losses in some fields. Rhizoctonia solani was the principal pathogen isolated from disease seedlings. A general disease survey of canola, conducted later in the growing season indicated disease incidence and severity was lower than in previous years, due to the drier than normal growing season.

A disease survey of barley indicated common root rot is still the most destructive disease and caused an estimated mean yield loss of 13%. Total yield loss to barley diseases was estimated at 15%. Barley leaf stripe was found for the first time in recent years in six commercial

fields.

Yellow leaf blotch, common leafspot and spring blackstem were the most common diseases of alfalfa. Verticillium wilt has not been found in the regional surveys to date.

Snow mold caused extensive damage to the few fields of winter wheat that were sown in the region and considerably less damage to fall rye.

Seed treatments were evaluated in field trials for control of diseases of barley, wheat, and canola. Insecticides and fungicides were tested for control of insects and diseases of alfalfa seed crops.

Information on disease and insect control was presented at 29 extension courses, seminars, and field days. The results of six applied research projects were published in the ECPUA Pesticide Research Report. The results of root maggot survey were submitted for publication in the Canadian Entomologist. Newsletters, information releases, and radio talks were prepared as required.

Olds Laboratory

The regional crops laboratory provided a diagnostic, survey and extension service on plant diseases, insects and weeds for Region II and the western half of Region III. This laboratory also operated the Alberta Seed Potato Program. Staff at Olds College handled insect and weed diagnoses in exchange for teaching two plant pathology courses by the Laboratory Head.

Specimens processed consisted of 576 diseases, 236 insects and 154 weeds. This is an increase of 227 specimens over last year. The main problems were herbicide injury, winter injury, fireblight, root rots, birch leaf miner, spider mites, larder beetles and box elder bugs.

The Alberta Seed Potato Program supplied 9,467 tubers and cuttings to seed potato growers and tested them on the farms for Potato Virus X and Potato Virus S. An additional 3,760 cuttings were grown in

isolation to produce pre-elite seed tubers for distribution to seed growers in 1982. Seed growers planted 1,600 acres of seed potatoes, up 400 acres from 1980. However, due to lower yields, production was about the same.

Summer and winter indexing consisted of testing 5,240 potato plants from our isolation plots for Potato Virus X, Potato Virus S, Potato Spindle Tuber and Bacterial Ring Rot. In addition, 5,125 plants from growers' fields were tested for Potato Virus X and Potato Virus S.

Promotion of Alberta seed potatoes in cooperation with International Marketing resulted in the sale of 61,500 cwt of seed potatoes in the Pacific Northwest of the U.S. The new greenhouse for the Alberta Seed Potato Program at Olds should be ready for use in July, 1982.

ANIMAL PEST CONTROL

Prime responsibility for control of vertebrate pests continued with individual producers. The relevancy of the self-help policy becomes more apparent with the turnover of municipal fieldmen and with widening duties of field staff on animal pests other than predators.

Animal pest control was regionalized with the appointment of regional supervisors at Lethbridge, Vermilion and Edmonton during the latter part of the year. Regional Supervisors of Vertebrate Pest Control will each cover the complete range of animal pest control work. This is changed from the former division of work on predators and rodents by two field supervisors operating out of Edmonton headquarters.

As in past years, responsibility for local animal pest control remained with the municipal agricultural fieldmen. Where predation problems were severe, seven regional predator specialists were available for advice and control of damage by coyotes and other animal pests. Programs functioned on the principle of minimum interference with

wildlife, subject to adequate control of economic damage to crops and livestock and the health of man. Three major endeavors were: to keep Alberta rat free; to limit skunk rabies; and to reduce coyote damage. Programs to control various other vertebrate pest problems were also operated.

Rat Control

Alberta was basically kept free of Norway rats for the 31st consecutive year. The objective of eliminating all infestations in Alberta overwinter was essentially accomplished.

The following table outlines the rat situation at the end of March, 1982 by municipal units along the east border with 1979/80 and 1980/81 data for comparative purposes.

TABLE 1. THE RAT SITUATION 1981/82

District	Bait Distributed 81/82		79/80	Premises Checked		Infestations Exterminated			Infestations Remaining March 31*		
	lbs dry	WS pkg		80/81	81/82	79/80	80/81	81/82	80	81	82
I.D. #18	785	25	240	367	350	0	0	5	0	0	0
Co.Verm.R24	3126	520	831	996	1060	75	61	56	7	11	1
MD Wain 61	1060	16	376	282	329	3	3	5	0	0	0
MD Provost	1435	100	537	588	450	8	14	21	3	4	1
Sp A.2,3,4	5116	590	492	499	399	3	4	3	0	0	0
MD Acadia34	1530	125	87	140	100	0	0	0	0	0	0
I.D. 1 & 2	2550	0	305	535	500	8	7	2	0	0	0
TOTALS	15602	1376	2868	3407	3188	97	89	92	10	15	2

*Table compiled from reports by pest control officers of the seven municipal units for year ending March 31/82.

Invading rats were halted along the 30 km wide, 600 km long buffer zone on the Alberta-Saskatchewan border extending from the Montana border north to Cold Lake. A total of 3,188 farms, grain elevators and other premises were periodically checked by municipal and provincial officers. Many infestations were systemically eradicated by the

co-operative action of residents and pest control officers. Confirmed rat infestations in 1981/82 in the east buffer zone decreased to 94 from 104 the previous year.

As indicated in Table 1, the pressure of invading rats continued in the County of Vermilion River with 57 infestations and in the City of Lloydminster with an estimated 10 infestations in 1981/82 compared with 61 and 6 respectively in 1980/81. A second pest control officer, employed by the County of Vermilion River to help control the widespread infestation, was terminated at the year's end. Strong development of industry and acreages has favoured rats and other pests. Some residents have waited for the pest control officer to discover rats by himself. Consequently a number of infestations were much larger than they should have been. Littered premises and poor farming practices by some individuals aided rats in establishing and hampered control work. However most landowners reported rats and assisted in the clean-up of infestations by raising or removing old buildings and by keeping tidy premises.

Warfarin poison bait continued to provide the most effective control. About 8 tonnes of ready mixed warfarin type bait and 1,400 packages of water soluble warfarin bait were used to destroy thousands of invading rats. Gassing with carbon monoxide also destroyed many rat infestations particularly in the County of Vermilion River. Within the province a number of rats arrived from time to time with train and truck shipments. Most were dead on arrival but some survived long trips.

Emphasis was maintained on good public relations and education. Suspected cases of rats were investigated and identified promptly thanks to reporting by an alert and rat-conscious public. Such cases were handled mainly by some 300 pest control officers appointed by rural and urban municipalities. Most of the sightings turned out to be muskrats.

Bait materials, purchased by tender, were supplied without charge for rat control to the seven municipalities along the Alberta/Saskatchewan border. Salaries and expenses of eight municipal

pest control officers along the east border were funded by 100% grant from Alberta Agriculture. Some of the pest control officers in these municipalities ranged into Saskatchewan, which helped push rats back from our border and aided Alberta in staying rat free.

The Saskatchewan rat control program is gradually becoming effective province-wide. Successful rat control in Saskatchewan will help to keep Alberta rat-free. Initiation of a rat control program in Manitoba also has increased interest across the prairies and new hope for Alberta.

Pocket Gophers

Pocket gophers damaged hay crops, pastures, gardens and lawns. Many inquiries were received from acreage holders. Burrow builder machines were used for field control along with hand probing of baits, and some very effective clean up by trapping. Strychnine on grain was the most effective and commonly-used bait. The Alberta Association of Municipal Districts and Counties handled supplies of 5% liquid strychnine for pocket gopher control. Timely trapping has proven effective in removing substantial numbers of these rodents. Research by the Alberta Environmental Centre on herbicide control of broadleaved plants in pastures has shown some promise of controlling pocket gophers.

Richardson's Ground Squirrel

Liquid strychnine 2% continued in use on grain baits. Use of treated grain prior to "green-up" in the spring producing best control results. Bait stations with strychnine 2% treated grain were reported successful for field control. Testing of toxicant acceptance and baiting methods, including bait stations, is continuing.

Other Nuisance Animals

Snowshoe hare numbers "crashed" in some northern areas but continued high and damaging in others. Considerable overwinter damage occurred again as in recent years. Reforestation plantings and farm shelterbelts were damaged. Mice were numerous and populations survived well over winter. Some damage to ornamentals was reported. A number of

garter snake infestations in buildings were reported. Many inquiries were received on ground squirrels, pocket gophers, skunks, badgers, bats, muskrats, and other nuisance animals.

Magpie and Nuisance Birds

Magpie control was done mainly with the "Improved Magpie Trap" which was highly successful when used properly. Use of strychnine was generally discouraged but found to be necessary in some situations, such as damage to new-born lambs or calves and branded or injured livestock.

Sparrows, starlings, pigeons and blackbirds prompted many inquiries. Various scaring devices, repellents and other techniques were field-tested and recommended for economic damage situations. Reports continued of blackbird damage to cereal grain and corn. A survey of blackbird damage was carried out during 1981 by the Alberta Hail and Crop Insurance Corporation. Although total damage by blackbirds was low due to the early harvest, there were 21 producers out of 29 surveyed who suffered over 1000 dollars loss each.

Coyote Control

The average price of coyote pelts was approximately \$75.00 each for the 1981/82 pelting season, down approximately \$10.00 from 1980/81, as reported by Edmonton Fur Auctions. Harvesting of coyotes for their fur continued at the high level of recent years.

Many livestock producers required assistance to control coyote predation on livestock and this was provided in most cases by municipal agricultural fieldmen or regional predator specialists (Table 2). Many producers handled their own coyote problems after being supplied and trained in the proper use and handling of control materials. Preventive measures such as improved livestock management and carrion clean-up were stressed to producers to prevent or reduce further losses.

TABLE 2: VERTEBRATE COMPLAINTS HANDLED BY PREDATOR SPECIALISTS

<u>Year</u>	<u>Coyote</u>	<u>Wolf</u>	<u>Dog</u>	<u>Fox</u>	<u>Bear</u>	<u>Cougar</u>	<u>Lynx</u>	<u>Rodents</u>	<u>Birds</u>	<u>Skunk</u>	<u>Others</u>
1979/80	271	10	35	5	12	6	0	107	52	67+	11
1980/81	311	14	33	2	29	1	0	96	59	99	13
1981/82	355	20	41	16	16	4	0	93	131	93	8

* Beaver, Ground squirrels, Rabbits, Rats, Mice, Pocket gophers
 ** Magpie, Sparrow, Pigeon, Blackbird, Hawk, Owl
 *** Mink, Weasel, Raccoon

The number of cyanide shells issued increased 38% compared to 1980/81. This was largely due to the replacement of faulty, unuseable stocks of cyanide shells returned from municipal offices. Strychnine use declined slightly but it remained the most used toxicant for coyote damage control, (Table 3). Other control techniques involved shooting, trapping, snaring, den hunting, use of hounds and calling/shooting.

TABLE 3 - TOXICANTS DISTRIBUTED FOR COYOTE CONTROL IN ALBERTA

<u>Year</u>	<u>Cyanide Shells</u>	<u>Strychnine Units</u>	<u>1080 Baits</u>	<u>Est. No. of Coyotes Killed</u>
1977	1863	7,934	25	2,704
1978	1549	6,670	0	2,263
1979/80	1453	6,100	14	2,392
1980/81	1041	3,840	14	1,611
1981/82	1672	3,632	13	1,879

The importance of safety, in handling and placement of poisons, was stressed to those involved with coyote control. Selectivity and humaneness in effecting control were also emphasized. In September, 64 field personnel were provided with information and control techniques for coyotes and other vertebrate pests at the annual training seminar at Pigeon Lake. Field tests for Zon guns, 1080 toxic neck collars, methomyl shells and other control methods were carried out. These will continue to be tested and monitored as well as other techniques.

Thirteen 1080 baits were set out during the winter of 1981/82, 12 within the M.D. of Cardston and one in the M.D. of Foothills. These

baits were set out to remove coyotes in close proximity to sheep farms with a history of coyote damage. A large percentage of the sheep in the province are located in the M.D. of Cardston and coyote damage is a constant threat. The estimated number of coyotes killed by the three approved toxicants (strychnine, cyanide and 1080) increased from 1,611 in 1980/81 to 1,879 (Table 3).

Compensation payments continued, through the Livestock Predator Indemnity Program for livestock losses confirmed as predator-caused during the 1981 calendar year. Payments totalled \$257,358 (508 claims), of which \$114,466 (296) claims) were for coyote-caused losses, \$70,542 (64 claims) for wolf-caused losses, \$43,422 (86 claims) for bear-caused losses and \$28,923 (62 claims) for losses caused by other predators. Total compensation paid for livestock losses to predators decreased slightly from the \$260,379 (506 claims) paid in 1980. Compensation payments for coyote-caused losses in 1980 (\$138,263 - 315 claims) were also slightly higher than 1981 payments.

Rabies Vector Control

The program to prevent and limit the spread of rabies in Alberta was continued under the general direction of the Central Rabies Control Committee. Despite the high incidence of skunk rabies in Saskatchewan and Montana, the disease was confined to the outbreak area of southern Alberta where it became established in late 1979 and 1980. This incidence of skunk rabies decreased with 23 rabid skunks diagnosed in 1981 compared to 53 in 1980 (Table 4).

Special crews were used to continue surveys and monitoring of skunk rabies, and to depopulate skunks wherever rabies were found. Predator specialists and municipal agricultural fieldmen assisted with skunk depopulations for positive cases.

Of 1639 skunks submitted for analysis, 23 proved rabid. Eighteen positive cases occurred in the County of Warner, four in the County of Forty Mile, and one in the County of Newell. One rabid dog was diagnosed at Warner and nine rabid bats from scattered points across

central and southern Alberta (Table 4). There were no losses of livestock to rabies and few human involvements.

Depopulation of skunks continued in the 30 km wide buffer zone along the Alberta/Saskatchewan border and an estimated 1,050 skunks were removed. Poison skunk pellets, traps and shooting were the most efficient and economical control methods. About 300 strychnine pellets were used by pest control officers in the 18,000 sq. km (600 x 30 km) buffer zone. No rabid skunks were found in the buffer zone for the fourth consecutive year.

The Fish and Wildlife Division continued to handle bat rabies and also monitored skunk numbers in the east border buffer zone. The 3 mile radial skunk depopulations were performed as a cooperative effort by staff of the Pest Control Branch, the Fish and Wildlife Division and the local municipality.

TABLE 4. SUMMARY OF ALBERTA POSITIVE RABIES CASES*

Year	Total Positives	Domestic Animals	Wildlife Animals			Total Specimens Analyzed
			Skunks**	Coyotes	Bats	
1977	15	1(cow)	4 (2)	0	10	1130
1978	5	0	0 (0)	0	5	571
1979	25	0	13 (0)	0	12	1009
1980	65	1(cat)	53 (0)	0	11	1778
1981	33	1(dog)	23 (0)	0	9	1639
TOTALS	143	3	93 (2)	0	47	6127

* Analyses by Animal Diseases Research Institute, Agriculture Canada, Lethbridge, Alberta.

** Bracketed figure is number taken in depopulation buffer zone.

VERTEBRATE PEST COMMITTEES

The Problem Wildlife Committee continued to coordinate vertebrate pest control programs between Agriculture and Fish and Wildlife. A "Managing Problem Wildlife In Alberta" brochure was developed and distributed, outlining current policy and programs on animal pests and

their management. A manual on animal pest control techniques is being developed for the use of government field staff.

The principles of prevention, compensation and control were incorporated where possible in control programs such as beaver flooding, bear damage to beeyards, ungulate damage to stacked feed, etc. The use of beaver flood drain culverts was promoted as a means of reducing flood damage without destroying dams or beaver. The compensation program for bear damage in beeyards covered \$9,264 loss of equipment and bees by 13 beekeepers. The policy was revised for 1981 to increase payments for bear damage and to allow beekeepers to salvage bees and equipment without waiting for inspection of damage.

The third meeting of the Western Committee on Vertebrate Pests (WCVP) was held at Winnipeg in October. An excellent review was done of programs underway in the western provinces on birds, ungulates, rodents, predators and other vertebrate pests. Terms of reference for the WCVP were consolidated. Research needs and problem solutions are to be inventoried and reviewed on a continuing basis. The Supervisor, Animal Pest Control continued as secretary of the WCVP.

The Expert Committee on Vertebrate Pests (ECVP) held its second meeting in Ottawa in February 1982. The major vertebrate pest problem across Canada were defined and agreed upon. Six research projects were selected for federal funding of \$100,000. It was agreed that provincial wildlife representatives were required on ECVP to coordinate agricultural-wildlife activities in handling problem wildlife.

The Branch Head continued as the Alberta representative on ECVP; gave an invited paper on Compensation for Vertebrate Pest Damage at the Tenth Vertebrate Pest Conference in Monterey, California in February 1982; and provided a testimonial report in support of some 32 western U.S. agencies that had applied for re-registration of compound 1080 for coyote control, in March 1982. This latter action was followed up by cross-examination at a public hearing on compound 1080 before the Environmental Protection Agency in Washington, D.C.

C. SOILS BRANCH

The following is an outline of programs and activities of the branch during the 1981-82 fiscal year.

Soil Productivity and Fertilizer Use

In keeping with branch objectives, activities continued involving extension and applied research continued in areas of i) nitrogen fertilizer placement i.e. banding, ii) potassium soil test evaluation and iii) nitrogen efficiency.

FERTILIZER SALES IN ALBERTA IN METRIC TONNES

(By Analysis and Nutrient Content)¹

JULY 1 - JUNE 30

<u>FERTILIZER</u>	<u>1979-80</u>	<u>1980-81</u>
82-0-0 (Anhy. Amm.)	132,782	158,601
34-0-0 (Amm. NO ₃)	102,131	108,583
46-0-0 (Urea)	114,295	157,311
21-0-0 (Amm. SO ₄)	17,420	20,943
28-0-0 (N. Soln.)	18,195	23,041
23-23-0	36,800	40,647
27-14-0	10,530	12,625
Urea Phosphates	6,266	10,315
11-48-0	79,985	90,339
11-51-0	---	89,913
11-55-0	116,481	74,360
Other MAP	21,645	---
18-46-0	631	659
16-20-0	19,701	19,685
10-34-0 (Soln.)	1,723	1,837
0-0-60 (KCl)	21,347	22,426
Others	17,690	17,156
Mixed (N/P/K)	11,437	10,792
TOTAL	729,059	859,233
Nitrogen (N)	249,603	302,154
Phosphorus (P ₂ O ₅)	134,181	154,623
Potassium (K ₂ O)	17,489	14,732

1 Source: Western Canada Fertilizer Association, Calgary.

Four irrigated crop test plots were placed on farmers' fields in the Vauxhall and Bow Island areas. A wide range of nitrogen and phosphorus treatments were applied. Soil moisture levels were monitored during the growing season.

For its expanded irrigated soil fertility research program the Soils Branch purchased fertilizer placement equipment, tillage equipment, a tractor, and a trailer. The equipment is adaptable to cereal as well as row crops. Most of it was in place upon the arrival of the new Irrigated Soil Fertility specialist.

SOIL ACIDITY

In June 1981, the Minister announced the Agricultural Lime Freight Assistance (ALFA) program which provides grants to farmers covering 80% of the freight costs after the first \$5.50 per tonne of transporting lime from the quarry to the farm. The announcement of the program provided incentive for the development of a supply of agricultural lime and marl. One source of agricultural lime at Exshaw and a number of marl deposits in west-central Alberta developed by late fall. Sixty-four (64) applications were received representing more than 5,000 tonnes of lime or marl with \$166,000 paid in grants. Considerable new development activity occurred during the latter part of the fiscal year for sources nearer areas of need such as west-central Alberta and the Peace region. Lime is required to neutralize acid soils as a result of natural acidity and/or use of nitrogen fertilizers. Three firms developed transportation, application and soil sampling services located at Grande Prairie, Ponoka and Westlock.

Dryland Saline Seep Control

The objective of this activity is to prevent the spread of dryland saline seepage and reclaim the areas already affected. Efforts were directed towards expanding research and technical assistance. Special efforts were made in developing subsurface drainage design standards for dryland saline seeps.

A Farming for the Future Research project entitled "Development of

"Agricultural Subsurface Drainage Design Standards for Alberta" was initiated. Preliminary hydrogeological investigations were carried out on 14 prospective research sites. Field scale sub-surface drainage systems were installed on three and a half sites when the sudden severe frost halted operations. Plastic corrugated pipe was placed at various depths (150, 210, and 270 cm) and spacings. Soil salinity, water table levels, discharge rates and quality are being monitored. Dr. Nader Foroud joined the research team and is supervising the project.

Three existing subsurface drainage demonstration projects were monitored for the fourth year. The tile discharge rates and the effect of the tile on the water table were large because after three years the soil finally opened up and regained some of its old permeability. Furthermore, last spring, levels of precipitation were high causing water tables to rise well above the tiles.

The Soils Branch responded to a request from the recently organized Dryland Salinity Control Association and was committed to acquire staff for a dryland saline seep control investigation and monitoring service. The objective of the service is to locate problem recharge areas and advise on cropping programs to eliminate the latter. This is a cooperative service with PFRA and Alberta Environment.

Approximately 25 routine dryland saline seep investigations were carried out. The purpose of most of these was to determine the feasibility of drainage. The great variability of soil and groundwater conditions in saline seeps and the large risk and cost of subsurface drainage systems necessitates on-farm investigations.

Three applied research plots of salt tolerant forages were maintained. Rhizomatous grasses were grown in one. Their root material will be used for transplanting ("sprigging"). Garrison Creeping Foxtail and Prairieland Altai Wild Ryegrass had good stands.

Soil Conservation and Improvement

Farmer interest in managing solonetzic soils to increase productivity continued. Although test plot results demonstrate that yield increases are greater with deep plowing (20 - 30") than deep ripping (15 - 20"), farmers have probably ripped between 5,000 and 10,000 acres in the last year. In addition to the hardpan limitation of solonetzic soils, production is also limited by low pH (acidic) surface horizons. Initial plot results indicate that "normal" liming recommendations may not be effective unless accompanied by other measures such as deep ripping to disrupt the hardpan (i.e. the main limiting factor to production).

Geoff Hughes-Games, a soils technologist working on the Solonetzic Soils Deep Plowing Feasibility Study resigned in August to pursue studies toward a B.Sc. in Soil Science.

The Solonetzic Soils Working Group of the Alberta Soils Advisory Committee met in March 1982. The Soils Branch will publish a proceedings including 12 scientific papers and research updates.

Wind erosion in the spring of 1981 was moderately severe particularly in Regions I and II. It is estimated that 250,000 acres may have been affected. Most of the damage was associated with summerfallow fields, especially those which had been overworked leaving little crop residue for protection. A Soil Management Committee has been formed in Region II and has selected soil conservation as its number one priority.

Water erosion continues to be a problem in the Peace Region, with about 80% of the erosion occurring during snowmelt on summerfallowed lands. Soils Branch staff initiated production of a feature film that will document the problem and provide some remedial and prevention options to the viewers. It is hoped that most of the shooting will take place during 1982 and that the film will be completed by the spring of 1983.

Soils Branch staff are working with University of Alberta personnel on a "Crop Residue Management for Moisture Conservation" study. The project will be conducted in Region II and will involve Alberta Agriculture personnel and local farmers.

Branch staff also assisted University of Alberta personnel in a "Soil Organic Matter Survey". The study will cover all of the soil zones in all regions of the province and will involve Regional Plant Industry Supervisors, District Agriculturists and local farmers.

Members of the Soils Branch Staff inspected soil erosion control and reclamation projects under the Soil Conservation Area Program through the Agriculture Service Board Program. Guidelines were updated to help clarify which projects would qualify.

The Soils Branch was also involved in concerns of reclamation and conservation of good agricultural land through its representation on a number of interdepartmental committees, including the Development and Reclamation Review Committee, Exploration Review Committee and Crown Mineral Disposition Committee. In addition, a member of the branch represents Alberta Agriculture on the Reclamation Research Technical Advisory Committee that coordinates funding for reclamation research in Alberta.

Branch staff chaired an interdepartmental committee that studied the impacts of pipelines on agricultural lands. Results of a consultants report should be released in 1982.

Agrometeorology

The agrometeorology program provided information and advice for producers on the effects of weather and climate on agricultural production. Information relating soil water status to fertilizer and cropping recommendations was distributed to producers. Other concerns addressed included drought, frost risk, winter survival of crops and soil erosion.

The growing season was drier than normal in the Peace and northwestern agricultural areas. Rainfall during the May through September period was about half of normal at Peace River and Vermilion. Hay and pastures were adversely affected, as were most annual crops. Meanwhile, the southern half of the province experienced favourable growing weather for the most part. Rainfall amounts were mainly above normal.

Soil water recharge during the fall period was minimal, and soil moisture carryover to the spring of 1982 was therefore reduced. It was a cool late spring in most parts of the province.

An applied research project was carried out to assess the importance of certain bacteria in causing frost damage to crops. Barley and wheat plants tested were found to harbour large populations of ice nucleating bacteria, increasing crop susceptibility to freezing injury. These results suggest potential for crop protection if the bacteria can be successfully controlled.

Laboratory Services

The Agricultural Soil and Feed Testing Laboratory (ASFTL) has the following purposes:

- To provide an analysis and reclamation service for soils, plant and animal feeds to the general public on a fee basis;
- To provide diagnostic and investigational services for the Department of Agriculture on a no-fee basis with regard to special soil, plant and animal feed problems;
- To conduct applied research to delineate major problems in crop and animal production and where possible, to initiate projects to solve them; and
- To compile and summarize analytical data for scientific and diagnostic use.

Laboratory Sample Volume

During the year a total of 36,772 samples were received for analysis (Table 2). This represents an increase of 4,043 samples over the average for the previous three years. It is common for sample numbers to vary considerable from year with seasonal variation and requirements of producers, extension and research.

Table 2
LABORATORY SERVICES - SAMPLE VOLUME
Number of samples for each fiscal year*

Type of Sample	Feeds and Plants		Farm Soils		Greenhouse & Garden		Total	
Regular	4,779	3,224	13,023	13,086	1,566	1,480	19,368	17,790
Diagnostic	1,786	2,139	1,513	1,700	190	201	3,489	4,040
Research	2,122	4,337	6,563	10,605	-	-	8,685	14,942
Special Fees**	194	-	993	-	-	-	1,187	-
TOTALS	8,881	9,700	22,092	25,391	1,756	1,681	32,729	36,772

* Fiscal Year - April 1 to March 31 of the following year.

** This category was eliminated July 1, 1980 with new fee structure.

Producer use of the testing services is indicated by the numbers of regular samples received. These are samples for which producers or agents representing producers are charged an appropriate fee for given analysis. Such samples represented nearly 50% of the total number of samples received by the laboratory. However, the total number of producer samples was 1,578 fewer than the average for the previous three years. This decrease is mainly reflected in the numbers of feed and plant materials category which is consistent with last year. It should be noted, however, that there are now several private laboratories in Alberta providing a similar service to producers. There is good evidence that the numbers of producer samples handled by these laboratories is increasing over previous years and therefore the net result is that larger numbers of producer samples are being tested annually. This is considered a significant development for the use of laboratory analysis in production management.

Tables 3 and 4 show a breakdown of soil samples and feeds and plant samples according to the month received and sample submission classification. The majority of regular samples for both soils and feeds and plants were received in the five month period from September through January (78.1% for soil 75.2% for feeds and plants). Also the total samples received were high in all or part of this period. During this peak period turn around time on regular samples is often slower than other periods of the year. This problem is most severe for producers submitting soils because sampling must be delayed until after October to obtain reliable nitrogen assessment. Feeds can be tested soon after harvest, and extension efforts have resulted in earlier submission of these samples.

Table 3 Breakdown of Soil Samples According to
Month Received & Sample Submission Classification

Month	Regular	Demonstration	Research	Total
April	810	227	23	1,060
May	342	215	560	1,117
June	347	183	810	1,340
July	331	224	1,021	1,576
August	350	166	954	1,470
September	1,211	216	2,216	3,643
October	2,594	229	2,052	4,875
November	3,994	247	--	4,241
December	2,053	59	464	2,576
January	1,522	60	814	2,396
February	586	27	456	1,069
March	425	48	336	809
TOTAL	14,565	1,901	9,706	26,172

Table 4 Breakdown of feeds and plant samples according to the month received and sample submission classification

Month	Regular	Demonstration	Research	Total
April	103	149	395	647
May	65	81	48	194
June	52	135	701	888
July	101	208	1,110	1,419
August	165	200	334	699
September	601	400	244	1,245
October	562	236	152	950
November	580	233	--	813
December	326	173	--	499
January	350	100	79	529
February	167	82	781	1,030
March	147	140	493	780
TOTAL	3,219	2,137	4,337	9,693

Diagnostic samples are received from extension, regional and other department staff to assist with diagnosis of animal and crop production problems and to demonstrate production methods. Eleven percent of the total samples received were for these purposes. The number of diagnostic samples was 551 higher than the average for the previous three years. The use of this service indicates a continued need and interest by department Study Course and to develop a data base on various forage materials and qualities.

Laboratory staff from the plant and animal industry divisions are involved in a number of individual and cooperative research projects requiring sample analysis. These research samples represented 40.6% of the total samples received and were 6,257 samples higher than the average for previous years. Research projects involved work on animal

and plant nutrition and soils.

Laboratory Operations

Laboratory services offer several options for sample analysis to fit various producer, extension and research requirements. Three general groups of analysis are identified as:

- Routine - which is a package of several analyses common to feed quality and soil fertility assessment. (Usually 5-10 individual analyses depending on type of samples.)
- Special - includes various individual analysis often required to provide more detailed assessment.
- Mineral - up to 23 individual minerals including all essential nutrient elements for animals and plants (some are grouped as packages because of the method of determination).

Routine (package) analysis are generally performed on regular, diagnostic and most research samples and numbers of these analysis have been relatively constant for feed and plant material since 1978 (Table 5). The number of special and mineral analyses, however, have increased markedly over the same period. A similar breakdown for soil samples is not available for previous years, but current numbers reflect a similar requirement for special and mineral analysis. These numbers indicate an increasing interest in a broader spectrum of analysis and mineral nutrient analysis. This is an encouraging trend and is expected to continue.

Table 5 The number of routine, special and mineral analyses conducted on feeds and plant samples over the past four years and conducted on soil samples for 1981.

Analysis Group	<u>Feeds and Plant Samples</u>				<u>Soil Samples</u>
	1978	1979	1980	1981	1981
Routine	8,600	9,137	8,781	9,767	27,072
Special	613	1,484	2,437	2,850	6,204
Mineral	3,141	4,278	10,099	11,834	3,392
Total	12,414	14,899	21,317	24,451	36,668

The branch initiated a district soil sampling program to assist farmers with their sampling through a soil sampling service and to improve sample quality. Proper sampling is a critical factor in determining the available nutrient supply and fertility status of soils. Past research has shown that depth sampling to 30 or 60 cm provides better information for soil test interpretation and recommendation than only surface samples (0-15 cm). The program provides assistance for purchase of depth sampling equipment through agricultural service boards. During the year over 18% of the regular farm samples were received as depth samples and more than 47% of the diagnostic samples were depth samples.

Increasing recognition of concern for correcting acid soil problems is indicated by the 594 requests for lime requirement recommendations compared to less than 100 in 1980. Lime industry agencies and department staff were very active in promoting this special analysis.

LABORATORY METHODS AND RESEARCH

Methods of analyses for testing soils, plants and animal feeds are constantly being reviewed and improved to provide rapid reliable techniques. Work continued on trace mineral methods of analysis for soils, feed and plant materials to establish average levels and possible areas of deficiency. Development of the new infrared analysis technique

was delayed due to extensive laboratory renovations. However, considerable work was completed on test samples required for development and correlation of this technique.

Other method studies included:

- ammonium analysis of greenhouse soil
- development of rapid lime requirement analysis
- comparison of ashing and digestion methods for total mineral analysis
- development of several fiber techniques using new analysis equipment
- evaluation of total selenium and sodium chloride methods for feeds

Laboratory staff are expected to maintain a close working relationship with research agencies and department specialist. Co-operative research activities and diagnostic analysis services aid this objective.

A summary of some research activities was as follows:

- continued analysis of solonchic soil and plant tissues samples from deep plowing and ripping studies
- continued analysis of soils and plants from "Making the Most of Nitrogen" study
- continued determination of nutrient composition of forage species as affected by maturity and fertility in Region 5
- continued trace mineral research to expand data base for Alberta soils, plant and feed materials
- continued development of soil productivity data based in co-operation with University of Alberta, Agriculture Canada and Hail and Crop Insurance Corporation
- continued analysis of soil and plant samples from potassium response of annual crops in Regions 4 and 5
- effects of phosphorus placement on annual crop response in Central Alberta.

Laboratory Data Processing

Within the past year, major improvements in computing facilities at the laboratory have been made. Acquisition of new data entry equipment has increased our abilities for handling data and speeding up the computer processing and storage of information. Installation of new computer terminals linked to the government computing centre has allowed for easier access to the computing facilities for retrieval of stored database and analysis research projects.

Considerable use was made of the computer stored database during this year. This stored information has proved to be of increasing value for identification of specific and general inquiries concerning soil management and cropping practices. Studies using this database included:

- (1) Identification of soils having specific cropping history for organic carbon study.
- (2) Identification of soils in the Peace River region having acidic soil pH.
- (3) Identification of soils near the Vegreville substation indicating possible sulfur deficiency.

Computing facilities were also used for analysis of various research projects within the soils branch.

These included:

- (1) Soft White Wheat response to nitrogen fertilizer under irrigation.
- (2) Statistical analysis of plant materials from solonetzic soil studies.
- (3) Comparison of methods for determining total sulfur of soils.
- (4) Acquisition and storage of historic precipitation data for the province and development of mapping procedures.

D. WEED CONTROL AND FIELD SERVICES BRANCH

Ten staff members were employed by the Branch in full time activities designed to reduce crop losses attributable to weeds.

Considerable effort was devoted to making the field staff more self sufficient in the field of weed control. Formerly the Branch responded to requests for information and resources, but through the production of extension aids such as slide-sound kits, handout publications and displays which may be readily shipped from place to place and through continued emphasis on training for District Agriculturists and Municipal Agricultural Fieldmen, many of these requests may now be handled at the local level.

Metric conversion was a fact of life and thorough training of local extension staff helped to make the entire operation less traumatic.

A legal enforcement training officer was appointed and through a series of courses and training sessions in "Legal Investigation and Enforcement" the Municipal Agricultural Fieldmen and the Weed Inspectors were trained to better carry out the administration of the Weed Control Act. On the job training in collecting evidence and preparing Weed Notices helped enforcement officers to carry out their work more efficiently, and with more self confidence.

Public and media concern over the use of all pesticides, including herbicides, continued unabated. A pesticide issues co-ordinator was appointed in an effort to ensure that a balanced, factual view of hazards associated with the use of pesticides is presented.

Progress continued in efforts to alert industrial agencies such as utility companies, railways, and highways to their responsibilities in the field of vegetation management. Many of the larger organizations have assigned staff to this job, on a full time basis.

The Knapweed Eradication Program in Regions 1 and 2 expanded as further infestations were discovered. The ultimate goal is still to eliminate these species before they become established in the Province. More public awareness of the potential hazard associated with the spread of these weeds has resulted in the identification of more patches, generally on or associated with transportation corridors.

Progress with the Nodding Thistle eradication campaign continued in the City of Calgary. Some of the infested areas have now been developed for housing projects, others have been sprayed or cultivated. Nodding thistles were also treated at Claresholm and Drumheller.

Development of information systems continued on two fronts. The Weed Research Section, under Mr. F. Leavitt has summarized and published reports related to the minor use of herbicides. These have aided in obtaining additional registrations for minor use of herbicides.

The Weed Alert Program continued to gather information as submitted from the field and determine the distribution and density of various weeds. This information is useful in determining research priorities and for estimating yield losses and the need for control programs.

The Extension Section, under Mr. W. Yarish, continued with the development of a computer assisted herbicide selector program. Information is being restructured to fit computer programs so that in the near future crop and weed conditions may be matched with a herbicide and approximate cost of control provided, to aid in decision making.

Advances in the technology of application of chemicals are becoming more rapid. Roller applicators, rope wick applicators, charged particle generators, spinning disc and recirculating sprayers are all being introduced. Evaluation of these sprayers and other new concepts of sprayer design was continued. Changes in chemical formulations and in the use of various agents and techniques to control chemical drift were noted and evaluated.

An extensive series of research and demonstration plots were set out across the province in conjunction with local government. Thirty-six service boards participated in a total of 78 treated sites. The information developed is utilized to produce scientific papers as well as for local demonstration.

The branch continued to work closely with many outside agencies and industries in a variety of roles. With landowners, including large institutions such as railways, pipeline companies and other government agencies, we balance an enforcement role with persuasion and assistance to ensure that noxious and restricted weeds are controlled. Chemical companies represent a large group of contacts and we work closely to ensure that our recommendations to farmers are factual, current and compatible with label claims. Often we are involved with companies in investigating complaints of crop damage or non-performance. The majority of complaints continue to be the result of mis-application. Aerial applicators, environmental groups, the media, federal researchers and regulators, sprayer manufacturers and municipal authorities represent the majority of outside contacts next to our regular clients, the farmers of Alberta.

HERBICIDES USED AGRICULTURALLY IN ALBERTA - 1981

In calculating acreages treated, it has been necessary to assume that an average recommended rate was used.

2,4-D and MCPA (all formulations)

Assume 2 kg active treats 1 ha.

TCA - 5.6 kg treats 1 ha.

Dalapon - 1.34 kg treats 1 ha.

Other Chemicals

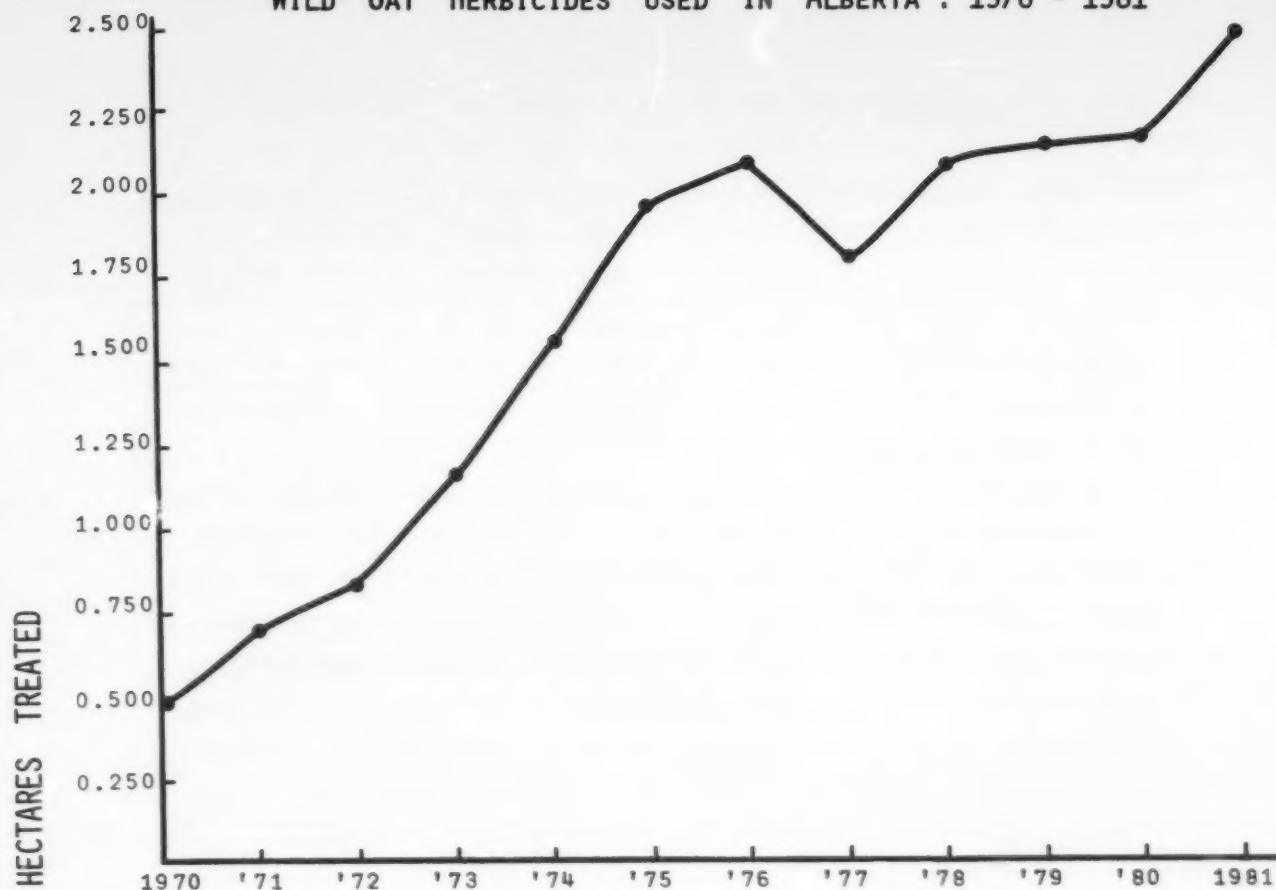
These include dicamba, bromoxynil, Stampede, Stampede CM, Tordon 202C, glyphosate, etc.

Wild Oat Herbicides

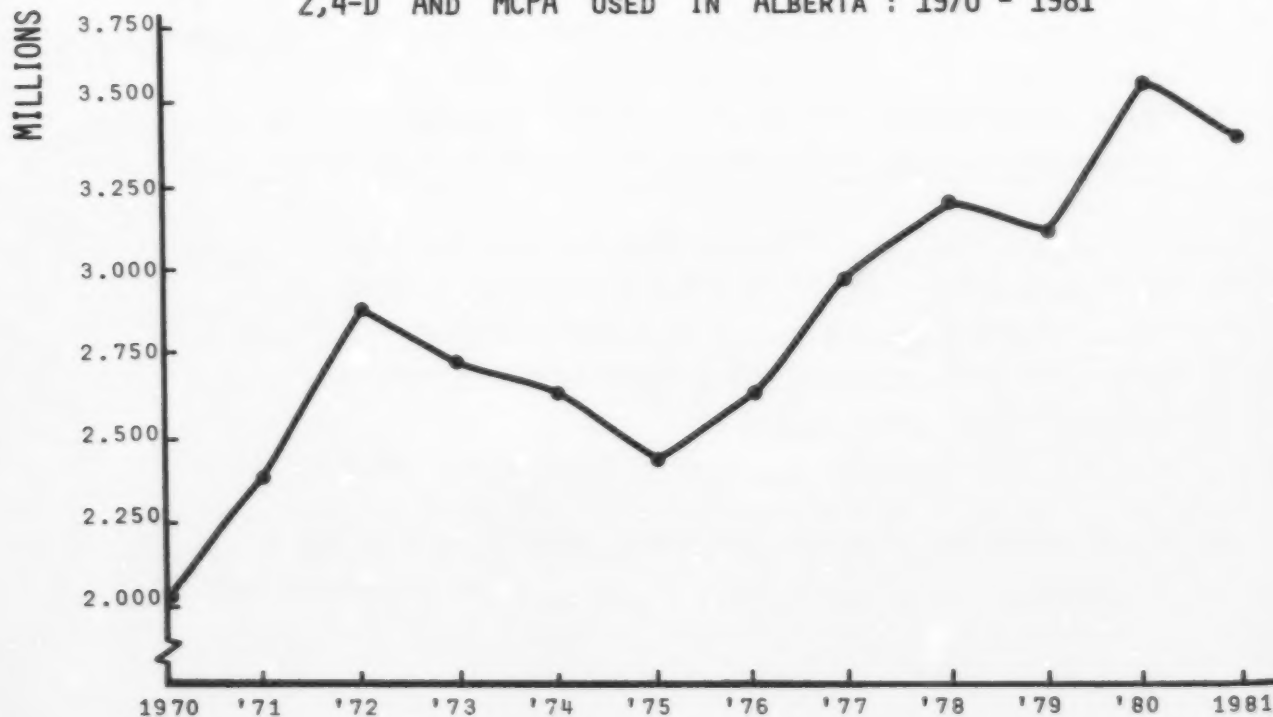
These include Avadex, Treflan, Avenge, Hoe-Grass, Asulox F, barban, Mataven, Eptam, etc.

Herbicide	kg active used		Total hectares		% of 1980
	1980	1981	1980	1981	
2,4-D Ester (standard volatile)	364,900	314,200	182,450	157,100	86
2,4-D Ester (low volatile)	201,200	171,700	100,600	85,800	85
2,4-D Amine	261,400	306,600	130,700	153,300	117
MCPA - Ester	256,400	253,300	128,200	126,650	99
MCPA - Amine	541,900	513,400	270,950	256,700	95
MCPA - Sodium & Potassium Salts	108,400	101,300	54,200	50,650	93
Total Common Phenoxies	1,734,200	1,660,500	867,100	830,200	96
TCA	129,500	68,600	23,125	12,250	53
Dalapon	200	300	149	224	150
Other Chemicals	285,300	536,000			188
Brushkillers	2,100	-	-	-	
Wild Oat Herbicides (hectares treated)	-	-	59,400	62,600	105

WILD OAT HERBICIDES USED IN ALBERTA : 1970 - 1981



2,4-D AND MCPA USED IN ALBERTA : 1970 - 1981



E. HORTICULTURE BRANCH

(a) ALBERTA TREE NURSERY AND HORTICULTURE CENTER

(i) Shelterbelt Program

Tree Distribution and Extension

The year 1981 was very favourable climate wise for nursery production. We experienced a mild winter, a cool and rather dry spring, abundant moisture during July and a warm and dry fall.

Between April 27 and May 21, 1981, approximately 2½ million shelterbelt trees and shrubs were distributed by the Alberta Tree Nursery. This does not include Arbor Day, surplus sales or miscellaneous distribution of some 260,000 seedlings. Around 7,000 tree orders were shipped while 1,500 orders could not be filled in part or in total. The following table summarizes the distribution by tree type.

<u>TREE TYPE</u>	<u>DISTRIBUTED VOLUME</u>
Tall Deciduous	620,080
Small Deciduous	55,170
Hedge Plants	1,423,595
Coniferous	353,970
Conservation Bundle	1,000

The production aim for shelterbelt planting stock was revised upwards to 3.7 million. It is expected that this volume of planting stock will become available in 1983. Additional land immediately west of the present nursery site will be brought into production to accommodate the additional 1,000,000 seedling production.

During the winter months (January - April) a three men crew carried out shelterbelt renovations in the MD of Sturgeon. Approximately 25 farmstead shelterbelts were pruned or thinned out. Six short courses were conducted dealing with shelterbelt establishment and farmstead

beautification.

The Alberta Tree Nursery employed an undergraduate horticulturist during the summer months, charged with investigating the problem of tree roots in the urban development.

Nursery Production

The following hardwood cuttings for 1981 production were made during the earlier part of 1981.

	<u>A.T.N. & H.C. Source</u>	<u>A.H.R.C. Source</u>
Willow Species	726,466	-----
Poplar Species	33,397	312,586

The following shelterbelt stock was lifted, graded and stored for 1982 shipping. The material is being overwintered in cold storage, root cellars and outside heeling in area.

Tall Deciduous	654,750
Small Deciduous	120,325
Hedge Plants	1,141,035
Coniferous	14,030
Conservation Bundles	2,000 (Bundles)

During the past growing season, a total of 490,000 container grown coniferous stock were planted into transplant fields.

Propagation of deciduous plants required the following amounts of seed by plant type.

<u>PLANT TYPE</u>	<u>AMOUNT OF SEED USED</u>
Tall Deciduous Species	63 Kg
Small Deciduous Species	18 Kg
Hedge Plant Species	146 Kg
Conservation Bundle Species	6 Kg
Coniferous Species	2 Kg
Miscellaneous Species	7 Kg

Production - Container Program

Container production for 1981 totaled 1,368,223 cavities grown within two crop periods.

Production Summary:

Deciduous material = 240,853 cavities

Coniferous material = 1,127,370 cavities

Summary of different containers used for production:

37cc container = 69%

160cc container = 29%

Other containers = 2%

The container shelterbelt production for 1981 totaled 963,671 cavities constituting 70% of total production.

Deciduous material = 143,087 cavities

Coniferous material = 820,584 cavities

Stock Shipped - Container Program

A total of 246,283 seedlings were shipped in 1981 to the following clients:

	<u>Deciduous Material</u>	<u>Coniferous Material</u>
Contract Growers	-----	130,600
Indian Affairs	-----	48,800
Land Reclamation	1,816	410
Special Orders	11,485	-----
Arbor Day	-----	34,000
Miscellaneous	1,805	17,367
TOTALS	15,106	231,177

Provincial Parks Program - Shipping

A total of 5,883 native trees were shipped to the various Provincial Parks in 1981. The native trees were shipped in 1, 2, and 4 gallon pots, bushel baskets and balled and burlap.

<u>PARK</u>	<u>POTTED DECIDUOUS</u>	<u>POTTED CONIFEROUS</u>
Hilliard's Bay	600	803
Tillebrook	200	---
Taber	145	---
Casseland	300	---
Sylvan Lake	800	100
Crimson Lake	---	200
Vermilion	100	320
Kananaskis	100	325
Cold Lake	400	790
Queen Elizabeth	700	---
 TOTAL	 3,345	 2,538

Deciduous Species - Dogwood, Mixed Willow and Plains Cottonwood Poplar
Coniferous Species - Siberian Larch, White Spruce, Lodgepole Pine,
Jack Pine and Scots Pine

(ii) Seed Investigation Section

The primary concerns of the seed investigation staff were three programs:

- a) Seed Investigations
- b) Seed Orchards
- c) Seed Laboratory

The seed section was particularly active in seed production research. A rapid expansion also took place in the Seed Orchard Program.

Seed Investigations

In 1981, the staff of the seed investigation section carried out the following seed studies to improve the results and methods of seed testing procedures to nursery and forestry production.

- a) Seed Stratification Experiment
- b) Experimental Seeding Project
- c) Seed Testing Project
- d) Propagation of Subtropical Trees and Shrubs
- e) Overwinter Storage of Bur Oak Seed
- f) The Effect of Rodent Repellent on Stratified Deciduous Seed

Seed Orchards

(iii) Saskatoon Plantation (Fruit Production)

Most of the commercial potential of the native shrub Amelanchier alnifolia (saskatoon) lies in the sweet, edible fruit (blue-blackberry-like pomes) which can be used for jams, whole preserves and juices.

Saskatoons can be grown commercially like strawberries and raspberries and they may be part of a small fruit grower's operation, such as a pick-your-own farm!

The main objectives for establishing the saskatoon plantation at the Alberta Tree Nursery & Horticulture Center in 1978 was to provide production stock and a demonstration area for prospective growers to study and improve production procedures, and to maintain mother stock of available production types.

Seed Production Orchards

Seed orchards at the Alberta Tree Nursery & Horticulture Center are located in fields #22 and #15. These were planted ten years ago in order to provide good parent trees.

The orchards now consist of over five hundred trees and shrubs representing coniferous and deciduous species from several different countries.

McCalla Fruit Orchard and Arboretum

A one acre fruit orchard was established for the purpose of public use in 1975 on field #27 as part of a trial of the Alberta Horticulture Research Center in Brooks.

The fruit orchard and arboretum were named after Mr. McCalla, who after over 30 years of service to Alberta Agriculture, retired in January 1981.

Seed Laboratory

The seed activities of the seed lab are concentrated in the seed testing laboratory, seed collection and extraction and seed storage programs.

1. Seed Testing Laboratory

A total of 1,365 separate seed test and retests were carried out last year in accordance with the rules of the Association of Official Seed Analysts. The newly acquired growth chamber, as well as the x-ray unit, used especially for deciduous seed species, are a great help in developing a rapid seed testing program.

2. Seed Collection and Extraction

In 1981, the fruits of over 30 species of deciduous and coniferous trees and shrubs were harvested in order to obtain the adequate supply of high quality seed needed to satisfy the increased field and container seeding program at the Alberta Tree Nursery and Horticulture Center.

Collected Species	Date of Harvest	Amount of Fruit/Cones Picked (Kg.)	Yield of Clean Seed (Kg.)
Tall Deciduous	20.08-20.11.81	544	420.11
Small Deciduous	31.07-22.08.81	228	27.40
Hedge Plants	20.07-20.10.81	822	71.24
Coniferous Trees	25.09-17.11.81	1835	9.80
TOTAL		3429	528.55

Investigations Section

This section of the Alberta Tree Nursery and Horticulture Center was involved in problem solving of nursery production practices. The following investigations were under study:

- a) Inv. #28 - Container Stock Media Trial
- b) Inv. #32 - Rooting and Dormancy Breaking in Saskatoon Softwood Cuttings
- c) Inv. #33 - Rooting of Saskatoon Root Cuttings
- d) Inv. #34 - The Effects of Peat Moss in Nursery Stock Packaging
- e) Inv. #36 - Propagation of Saskatoons with Hardwood Cuttings
- f) Inv. #40 - Chemical Weed Control in Transplanted Spruce and Pine

(v) Horticulture Extension

This office serves as the department's primary contact with amateur horticulturists throughout the province. These contacts are provided through a variety of means. Services were expanded in 1981 due to the addition of the Sod & Home Garden Specialist.

Horticulture Extension acts as a liaison between Alberta Agriculture and agencies involved with the development of amateur horticulture such as the Alberta Horticultural Association (A.H.A.), The University of Alberta Devonian Botanic Garden, urban municipalities (Parks and Recreation departments) and the universities and colleges.

The extension horticulturist is a member of the executive, and several committees of the A.H.A.; and a member of the Board of Trustees of the Friends of the Devonian Botanic Garden, and serves as the Activities Co-ordinator.

This office provides horticultural information to rural and urban Albertans by various means. The Extension Horticulturist plans, co-ordinates and teaches the regional courses offered through the offices of the District Agriculturists and District Home Economists. Each region is entitled to two courses that deal with topics such as greenhouse construction and maintenance, landscaping, indoor gardening

and general gardening.

Horticulture Extension also receives numerous requests for horticultural presentations that deal with any aspect of horticulture. In 1981, nine presentations were made.

Horticultural information is also disseminated by telephone, displays, radio, television, publications and audio visual aids. The office received over 2,400 telephone inquiries. A taped telephone horticulture message that is changed semi-weekly is provided. Four displays were assembled, Edmonton Klondike Days, L.A.N.T.A. Annual Convention and Field Days at A.H.R.C. and the A.T.N. & H.C. Six television interviews were given. One 13 minute film on landscaping "Design for Living" was produced. Horticulture extension also provides slide tape kits on various horticulture topics that are of interest to amateur gardeners. In 1981, three new kits on greenhouses and one on the A.T.N. & H.C. were added to the collection. Several existing kits were upgraded. The A.T.N. & H.C. began producing the newsletter "Nursery Notes". The Extension Horticulturist edited the one edition published in 1981.

This office administers three grant programs. One is provided to the A.H.A. and other to The University of Alberta Devonian Botanic Gardens to offset operating expenses. Grants are also provided to cities in Alberta to assist them in providing a telephone information service.

In recognition of the Year of the Disabled, Horticulture Extension, in conjunction with the A.H.A., hosted a two day workshop on horticulture as therapy.

Horticulture Extension staff sit on several government advisory committees: The Extension Advisory Committee, the Environmental Advisory Committee, and the Alberta Horticultural Advisory Committee.

Horticulture Extension worked closely with other areas of the department in the development of horticulture in the province.

(vi) Turf

In March, the position of Horticulture Officer changed to Agrologist. The new position title is "Sod and Home Garden Specialist". Duties include research in turf, extension work with Alberta Sod Growers, and conducting turf surveys.

Several sod growers across the province were visited. Contact was made with various other growers. Work began on a sod laying fact sheet for homeowners. Work on a turf manual resumed. A large amount of time was spent on amateur horticulture activities, such as courses, displays and horticulture inquiries.

(vii) Vegetable Program

The purpose of the vegetable program at the Alberta Tree Nursery and Horticulture Center is to provide an information service to market gardeners, and commercial growers of vegetables, potatoes and other horticulture crops. This is accomplished by various extension and demonstrational research programs.

Extension programs consist of short courses, field days, tours and numerous individual contacts. Also assistance is given to the Alberta Farmers' Market program and the Market Garden Development Grant Program, through which 17 applicants were approved in 1981.

The research aspect includes vegetable trial plots at the Alberta Tree Nursery and Horticulture Center at Edmonton and in the Peace River valley on the farm of the Peace River Correctional Institute. The trials consisted of both cultural and cultivar evaluations.

At the Edmonton site cultural trials included the testing of polyethylene mulch and tunnels on cucumbers and peppers; direct seeding versus transplants on cucumber, pumpkin and sweet corn. Cultivar tests were done on cucumbers, pumpkin, broccoli, sweet corn and storage cabbage.

At Peace River the cucumber polyethylene mulch trials were carried out as in Edmonton. Cultivar evaluations were conducted on cucumbers, cabbage, cauliflower, broccoli, lettuce, tomatoes, sweet corn, pumpkin, summer and winter squash.

A series of cultivar tests were again carried out by the colleges at Olds, Vermilion and Fairview, and at the University of Alberta in co-operation with Alberta Agriculture.

Summaries of all trials were prepared and are available from the Alberta Tree Nursery and Horticulture Center, R.R. #6, Edmonton, Alberta T5B 4K3.

(b) ALBERTA HORTICULTURAL RESEARCH CENTER

The Alberta Horticultural Research Center (AHRC) is the second largest provincially funded horticultural research unit in Canada and is part of Alberta Agriculture. AHRC conducts research and provides extension services in all areas of horticulture as well as non-traditional horticultural areas such as new or specialty crops grown under irrigation. Its resources of land, equipment and staff are available to the University of Alberta, Agriculture Canada and Alberta Agriculture's Plant Industry and Irrigation Divisions to conduct co-operative regional research projects.

The three sections of AHRC provide research development and extension services in all horticultural and commodity areas and disciplines. The Environmental Horticulture Section covers tree fruit, small fruit, bush and native fruit, ornamentals and nursery stock,

greenhouse vegetable and floriculture crops. The Special Crops Section covers processing vegetables, market garden vegetable crops, potatoes, corn and new crops such as drybean, forages, grain legume, spices and herbs. The Laboratory Services Section provides discipline support to all commodity programs as well as general plant science agriculture in southern Alberta in weed, insect and plant disease diagnosis, post-harvest physiology, food processing and bee husbandry.

General program support is provided by an Administrative Services Section and a Farm Operations Section.

The Center's research-extension specialists conduct fourteen programs with test sites located throughout the province. Tests at the Center's three main farms are supplemented by a research/demonstration facility for dry beans and other irrigated crops at Bow Island, vegetable culture and management trials at Edmonton and in the Peace River valley and twenty-seven co-operative tree fruit test orchards throughout the province ranging from the southern border with the United States to Fort Vermilion in the north. Additionally a Co-operative Vegetable Cultivar Testing Program is conducted with the University of Alberta and the Regional Colleges of Olds, Vermilion and Fairview. At AHRC, numerous trials in the vegetable and market garden programs were unfortunately lost due to an accidental contamination of irrigation supply with a soil sterilant.

Extension activities of specialists at AHRC are intended to support and complement programs of the extension staff at Alberta Agriculture's regional and district offices. Many Center staff have province-wide responsibility to work with commercial and amateur horticulture clients. This arrangement is designed to make the most effective use of staff expertise and training. Major extension activities of staff are maintained through close working organizations and direct contact on a one-to-one basis. As part of the ongoing extension education program, a number of short courses and seminars were conducted on topics ranging from irrigated sunflower production to market gardening. The broadcast media of television and radio were also effectively used to distributed

extension information.

Several commodity (industry) related field days were conducted by staff, these included: potatoes, market gardening, special crops, nursery trades and the greenhouse industry. These specialized field days allow researchers and producers the opportunity for first hand exchange of new information and ideas. In addition to field days, specialists also took an active role in industry meetings by presenting research reports. Several staff members serve as secretaries of industry advisory committees.

Center staff continued to provide expertise to other government agencies, through service on such committees as Farmer's Market Committee, several Canada expert committees, the Lethbridge Community College, Agricultural Program Advisory Committee and the Olds College Horticultural Advisory Committee. Assistance in evaluating loan applications for the Agricultural Development Corporation and providing statistical and industry status information to the Marketing Division.

AHRC is one of nine test sites for the prairie regional woody ornamentals trials, which evaluates hardiness and performance of prairie propagated material over a five year period. This major trial along with hardiness testing of new ornamental introductions, roses and perennials and overwintering trial of container grown woody ornamentals was a major component of the ornamentals program.

Screening of new herbicides and/or new formulations was again a major part of the Weed Control Program. Effects of various soil-active herbicides on succeeding rotational crops was studied.

The Apiculture/Entomology program emphasized honeybee colony management, overwintering and honeybee disease control.

The Food Processing Program continued work in developing new products and processes as well as quality studies of potatoes, vegetables and fruit.

Handling and storage of new potato and vegetable cultivars for storage performance continued in the Post Harvest Physiology program.

The greenhouse energy program continued to offer general extension services to growers and industry on greenhouse energy conservation and on the use of reject heat. A greenhouse energy use audit was completed with response from about 20% of commercial growers.

Cultivar evaluation is a major component of several AHRC programs; details are available on request. A detailed annual report, outlining the Center's research and extension activities for 1981, has been published and is available upon request.

V. REGIONAL REPORTS

REGION I - LETHBRIDGE

The mild, dry winter caused very little damage to over-wintering crops of winter wheat and woody plants. The average precipitation for the total year was concentrated in the growing season so the effect of these rains was magnified, resulting in a moist warm summer. The dry-land pastures and native range was at its best in the last decade. The absence of rainfall in the autumn meant poor moisture reserves and a very difficult seedbed for fall sown crops. Many crops of winter wheat were sown in October instead of early September.

Irrigated crops were good in yield and quality. Dry bean acreage expanded and a confectionery sunflower processing plant was established in the Bow Island area. Expansion of irrigated acreage continues.

Some of the newer crops have become well established, such as triticale, where acceptance in the human market is excellent and is good in the monogastric livestock feed market. Other new crops such as lentils and soybeans are very sensitive to price, as are fababeans. Consequently, the production varies from year to year.

The progress toward establishing dryland sorghum as an alternative to conventional cereal crops was slow as cold tolerance has been shown as an occasional problem. This year's sorghum production is to be used in large scale sorghum feed trials for beef cattle.

The knapweed control program has all but eradicated knapweed. Other weed control efforts have concentrated on scentless mayweed, nodding thistle, field bindweed and leafy spruce depending on location.

Insect problems caused little economic damage in total but losses were experienced by some producers due to stored grain insects.

The on-going Bertha Armyworm survey found the major infestation in an area centered in Vulcan. The levels of larva were high enough to cause significant losses in some canola fields. The European corn borer was identified in several corn fields in the eastern portion of this region. Eradication measures were carried out which emphasized cultural control.

Grasshoppers, aphids and other occasional insect pests were present at scattered locations and in small enough numbers to seldom warrant control. White mold of beans and verticillium wilt of alfalfa were both on the increase.

Dryland salinity increased at a rate of about 10% which is slightly above normal. Forage demonstrations of salt tolerant plants were established at New Dayton, Nobleford and Lethbridge. The testing of sprigging as a propagation alternative is a feature of these demos. A dryland salinity control association was established which involves the farmers and all levels of government and their research and service arms.

As many of the soils in the area have been farmed for 75 years, there is an increased interest in the ways to replenish the supplies of plant food. This interest has resulted in deep banding of fertilizers, the use of air seeders and a big increase in the use of liquid fertilizers. The cost price situation has resulted in some producers considering wonder fertilizers which claim great results with very small applications of nutrients. Other producers have turned to cheaper sources of conventional fertilizers south across the border.

Public contact continued to be in the areas of varieties, weed control, alternate crops and fertility.

REGION II - AIRDRIE

The 1981 crop season was normal in most respects. April was dry and soil erosion by wind was severe as a result of reduced winter precipitation. Seeding was advanced 2 or 3 weeks in some cases in an effort to curb the erosion before it worsened. As a result, stages of crop growth were spread out through the growing season.

The month of May was wet and crop and field conditions changed markedly culminating in an excellent harvest with above average yields.

August was hot and dry and some grades of barley were reduced because of light bushel weight.

Hay crop yields were good but quality was generally poor throughout most of the region. This was a result of excessive rainfall in July after the hay was cut.

A warm dry fall enabled producers to complete harvest and do all necessary field work.

Field crop insects and diseases did not develop to any extent and the weed situation was normal.

There appeared to be less attention and acreage devoted to the speciality crops. Region II climatic conditions are borderline for most of the specialty crops and producers consider them only when the cereal and oilseed crops outlook appears bleak.

Stored grain insects were severe in November and December. Producers resorted to grain fumigation in an effort to overcome the problem.

Seed plants in the region had another successful year. Volume was about 4.5 million bushels. Most plants showed building improvements.

Region II promoted and conducted an Irrigation & Forage Home Study Course program through the winter for producers. The latter course was carried out in co-operation with the Foothills Forage Co-op.

The 1982 Annual Meeting of the Society for Range Management was held in the City of Calgary, the first to be held in Canada since 1968.

REGION III - RED DEER

Rainfall varied considerably throughout the region in 1981 and yields reflected the moisture received. In the western districts above average rainfall was received and, although forage yields were high, quality was poor as little was harvested without weathering. In the north-eastern portion of the region, drought conditions existed and yields were below normal. Pastures were poor and a considerable amount of hay had to be imported to maintain livestock herds. In the rest of the districts, rainfall was plentiful and yields were near record levels.

Canola acreage dropped significantly from the previous year, with barley being the most common substitute. At the beginning of the 1981-82 Canadian Wheat Board crop year, on-farm grain supplies were fairly low but the large crop harvested replenished the supply.

More attention was focussed on problem soils as the acreage affected continued to expand.

Acid soils now occur in many of the districts and liming demonstrations were common to show the benefits gained by raising the pH. Deep plowing tests on solonchic soils were continued in an effort to develop criteria for their reclamation. Saline areas continued to expand also.

Interest in the "no-till" concept declined in all but the brown soil zone as tests indicated conventional methods were more profitable.

Fall work was reduced considerably as the threat of soil erosion was high. As a result, fall application of fertilizer and herbicides was minimal.

1981 was the first year of compulsory metric conversion for herbicides. Questions and problems with the change-over were less than expected as many extension offices and retail outlets hosted programs outlining the change.

Several acres were sprayed a second time for broadleaf weed control as a "second flush" of weeds appeared two to three weeks after the initial application.

Scentless chamomile continued to spread in the region and every district now has at least one infestation.

Two new weeds were reported in the region, corn speedwell and small bugloss.

Sclerotinia in canola, especially the Argentine varieties, was the number one pest of the province. Yield reductions were anywhere from 5% to 65%. The odd field was sprayed for flea beetles or armyworms, but their effect was minimal.

Forest tent caterpillar infestations were heavy in western districts.

Horticulture enterprises such as vegetable production, sod farming and nurseries maintained their share of the market place. Extension offices continued to receive many requests for information on farmstead planning and beautification.

The forage home study course was held in the eastern districts with limited success.

REGION IV - VERMILION

Drought conditions plagued nearly two-thirds of Region IV in 1981. Surface and subsoil moisture conditions were affected. Groundwater levels also seem to be dropping, many water wells lack previous pumping potential. Sloughs and lakes are either dry or much lower than before.

Moisture conservation through the use of snow-catch barriers, selective cultivation practices on stubble fields and further limiting the use of summerfallow could all be of benefit in Region IV.

The change in the method of applying fertilizer is in full swing. Real interest developed throughout the year in banding equipment, in particular the use of air seeders as banding equipment. The use of anhydrous ammonia continued to be popular. The use of Cold-Flo was limited by it appears 1982 will see a further increase in its application.

A trend to lower soil pH seems inevitable. Lime demonstrations on low pH fields are acquainting farmers with lime, its use and methods of application. Lime use will become one of the major soil amendment activities in the next few years. Large crop acres, the amount required and the long shipping distances will all be major obstacles.

Because of the dry conditions, dryland salinity continues to grow as a problem. There are indications of increased summerfallow acreage due to dry conditions and this, in turn, will increase the instance of dryland salinity.

Soil improvement through the use of annual cereal crops and forages for green manuring has become a topic of interest. Farmers are hoping for not only improved soil conditions but also for improvement in fertilizer utilization.

Weed control continues to be a major problem and expense throughout the region. Species adaptation is indicated by the spread of weeds such

as scentless chamomile, cleavers, corn spurry, hemp-nettle, tansy and chickweed. Wild oats and thistles continue to also be a serious problem. Farmers are finding that the multiple species population in a field means more than one chemical and/or application is necessary.

The control of aspen poplars on pastures and rangeland is an item of high producer priority. The lack of available chemical alternatives for spraying brush combined with the high cost of mechanical methods is hampering pasture development.

The Agricultural Service Boards continued to be a major vehicle of delivery of weed and brush control programs within the region. The complexity and cost of carrying out weed control programs means a continuing review of their value and cost must be done. Rural subdivisions, acreages, absentee landlords and operations make weed control and enforcement difficult for the local municipal authorities.

Farmstead beautification, amateur horticulture, farmers' markets and some specialized horticulture enterprises were important activities in Region IV. Farmstead beautification, including planning and material selection, is very popular with rural people and the requests for service often outstrip staff availability.

Shelterbelt renovation demonstrations are being used to advantage. Many shelterbelts planted 15 to 25 years ago are now reaching maturity and need maintenance to maintain their usefulness. Continued concern must be expressed concerning fence to fence clearing and the lack of interest in field shelterbelts or the maintenance of native shelterbelts when clearing land.

Cereal and oilseed insect populations were generally low in 1981. A grasshopper outbreak occurred in the northern part of the region affecting hay and pastures. Because this is also an important honey producing area, difficulties occurred in grasshopper control and its interaction with the honey bee population.

The bertha armyworm monitoring program indicated a low level instance of moths. Concern for the next two to three years must be expressed.

Norway rat infestations continue to appear along portions of the Alberta/Saskatchewan border in Region IV. These are eliminated as found but because of urban centers, livestock operations, oil activities and, in particular, acreage sprawl, these outbreaks continue to appear.

Widespread infestations of forest tent caterpillars occurred throughout Region IV.

Plant diseases are a continuing concern. With the introduction of more crops such as lentils, fababeans, peas, the importance of disease control must be emphasized. Several types of head blights, along with leaf stem and root diseases occurred in cereals and root disease in forages, particularly alfalfa and sainfoin.

Drought affected much of Region IV. The eastern half of the Region was severely affected not only in grain production, but more particularly in the production of forage. Large amounts of hay were brought into this area well into 1982. Severe grazing problems existed in 1981 and will be a concern in following years because of a general over-grazing situation.

The Lakeland Forage Association and East Central Forage Association are both excellent vehicles for forage demonstrations emphasizing variety, suitability and production management. Each year summer tours acquaint growing numbers of producers with improved forage management practices.

Alternate crops, especially lentils, were grown in Region IV in 1981. Management techniques, especially weed control, illustrated how dependent alternate crops are on these practices. Producers are looking for viable alternatives in their cropping practices and it appears interest in alternate crops will be strong in 1982.

The upgrading program for seed cleaning plants has been used extensively in Region IV and is an important reason for the continued strength of the industry. The St. Paul Municipal Seed Plant was destroyed by fire. Plans are well underway for rebuilding with the plant back in operation of the fall of 1982.

REGION V - BARRHEAD

Spring confirmed anticipated severe winter killing of legumes, especially older stands of alfalfa. Damage within individual fields ranged from slight to complete loss, with an overall reduction of 40 to 50 percent of alfalfa stands.

A dry, cool spring allowed almost continuous field work from April 20 to the end of May. Germination of later sown small-seeded crops like rapeseed and forage was slow and uneven. Total rainfall during May through September was near normal at 11 to 12 inches but nearly one-half of it fell in July. Unusually high temperatures in August caused abnormally rapid maturing of cereal and oilseed crops. Barley was affected most with potential bumper crops reduced by 10 to 20% due to shrunken kernels. The final result was yields about equal to the previous 5 year average. Weatherwise, 1981 was the best for harvest operations in the past 10 years.

Forage production was slightly above average in the Region and quality was good. Hay movement from the Region into the drought areas of the province removed a good surplus of feed this past winter.

Pasture production and management ranged from good to fair with below normal moisture in August resulting in some pastures suffering severe over-grazing.

Both the West Central and Pembina Forage Associations remained very active in 1981 with pasture projects for both Associations being highlight projects for the year. Pembina Forage Association

collaborated with Alberta Agriculture personnel and Vertec Industries Ltd., in the development and testing of a Forage Seed Harvester capable of harvesting Meadow Foxtail grass seed. Further testing to continue in 1982.

Two main areas of concern resulting in priority activities for 1981 include:

- a) alfalfa varieties, management and agronomics;
- b) pasture management including fertility, grazing systems and stocking rates.

Some interest generated in both forage seed production and silage making.

Forage extension activities including seminars, tours, written articles and farm calls remained high in 1981.

The interest in alternate (special) crops remained high with a trend towards more acres of fababeans, peas (mixture with cereals for silage) and triticale (for silage). A downward shift of lentil acreage in the Region caused by poor harvesting conditions in the fall of 1980.

Expertise in the production of alfalfa seed and management of leafcutter bees improved significantly in 1981. This plus the good weather conditions during 1981 pollination resulted in good alfalfa seed yield and 2.5 to 3.5 fold increase in bees.

Several seminars on Special Crops were held with excellent producer participation. Several Agricultural Services Boards viewed special crop demonstration plots during their 1981 summer area tours. The future of alternate crops for the northwest region looks favorable at this time.

At 10 co-op seed cleaning plants for the year ending June 30, 1981, 3,981,972 incoming bushels represented an 8% increase over 1980 and 31% more than 1979. A sharp decline in rapeseed acreage was the chief factor influencing demand for additional cereal seed.

All 11 Agricultural Service Boards carried out active programs in 1981 with major emphasis on weeds, erosion and water control, livestock and crop pests, and various demonstrations. For the first time, their requests for Department cost-sharing grants exceeded one million dollars.

Weed continued to be a major problem and expense to producers. Wild oats, thistles, chickweed, corn spurry, hemp-nettle and scentless chamomile topped a long list of speices causing concern.

Forest tent caterpillars were severe in several districts where their presence was extremely annoying to homeowners. The lack of practical control measures intensified their frustration. The most common crop insects were flea beetles and root maggots in rapeseed. Extensive monitoring of bertha armyworm moths was conducted by Alberta Environment. As the moth survey indicated, bertha armyworms did not present a problem in 1981.

Overall disease losses in cereal, forage and oilseed crops were relatively low, but in a few isolated cases yield reductions were medium to severe; e.g. 20 to 30% in some Park wheat crops from bacterial head blight, and up to 65% in a heavy rapeseed crop due to sclerotinia stem rot.

The number of shelterbelt trees and shrubs distributed in Region V declined from 344,682 in 1980 to 204,266 in 1981. Horticulture courses, especially gardening and landscaping, continued to be popular. Again, tree pruning demonstrations attracted good audiences in several districts.

A project to evaluate the fungicides Benlate and Rovral for the control of sclerotinia stem rot in rapeseed was conducted on 9 farms.

Numerous demonstration field plots conducted jointly with co-operating District Agriculturists, Agricultural Fieldmen and Agricultural Service Boards on various Plant Industry Division subjects

including herbicides, cereals, canola, forages (varieties, inoculation, fertility); soils and fertility; and special crops (triticale, peas for cereal silage, fababeans, caraway and canary seed).

REGION VI - FAIRVIEW

The year 1981-82 was the third year out of the last four in which hot, dry weather prevailed throughout the growing season. Those who heeded the early prognostications for an abnormally dry season and planted wheat, gambled and won. Wheat acres rose to the highest levels (700,000 acres) since 1967. Yields were about average but grades were exceptional with 75% grading No. 1 C.R. and high protein as well.

Other crops that fared well were alfalfa and bromegrass seed crops. Most other crop yields were moderately to severely reduced from the combination of heat and extended drought, particularly barley, rapeseed, most alternate crops and hay crops.

On a positive note, the harvest was much earlier and one of the easiest in memory with only a minimal amount of drying.

Research trials in 1981 included continuation with alternate crop trials, weed control in alfalfa seed crops and crop and soil management.

- a) Alternate crops - side banding or separating fertilizer from inoculated seed in lentils showed only a small increase in yield.
- b) Weed control in alfalfa seed crops - Embutox and Eptam were tested at various sites. Embutox provided very good control of a number of weed species.
- c) Crop and soil management - nine sites were established to evaluate the benefit of red clover green manure crops. Included in the plowdown trials are various cultivation treatments as well.
- d) Fall tillage trials - three sites were established to measure the effects of fall tillages of stubble.

Special emphasis was placed in three main areas of extension in 1981-82:

- a) Barley production including new varieties and liming.
- b) Cropping alternatives to fallow using green manure cropping in a continuous crop system. Seed dealers estimated as much as 200,000 acres of clover planted for plowdown according to 1981 spring seed sales.
- c) Weed control - special emphasis was placed on eradicating menacing weeds which are present only in small infestations notable scentless chamomile.
- d) Initiation of a new approach to control perennial sow and Canada thistles involving Ag. Fieldmen and farmer co-operators.

Another forage association was formed attracting livestock men in Central Peace area. This group has potential to cover off a large livestock population and the related needs.

Assistance and co-operation was provided to a number of D.A.'s in staging demonstrations and tours for producers. Properly and objectively planned, these tours and demos offer a unique extension opportunity to illustrate crops, practices and techniques.

Of significance in 1981 was the completion of a much needed co-op cleaning facility at La Crete. Seed cleaning facilities are now approaching complete coverage for the Peace region.

The addition of legume cleaning facilities in the Central Peace area proved to be filling a much needed service as demonstrated by the response both for cleaning and subsequent seed sales.

The annual seed plant inspection showed most municipal plants are offering a commendable cleaning service. A few need both manager training and upgrading of facilities.

The upgrading programs are now too becoming expensive and increasingly important to equate to the longevity of the plant itself.

Our thrusts in the future will be mainly to improve the content and delivery of programs to the farm producers in this ever changing field of agriculture.

VI. RESEARCH PROJECTS

I. INVENTORY OF PLANT INDUSTRY RESEARCH PROJECTS - 1982

<u>Projects</u>	<u>Pages</u>	<u>PMY</u>	<u>TMY</u>
Cereals and Oilseeds	95-96	3.55	24.15
Forage Crops	97-98	5.15	10.92
Special Crops	99-100	4.05	5.20
Ornamentals, Trees and Shelterbelts	101-102	1.79	4.04
Fruit Crops	103	0.39	1.40
Vegetables and Potatoes	104-105	3.55	6.46
Greenhouse Crops and Greenhouse Energy	106	2.15	3.00
Soil Management - Fertilizers - Analysis	107-108	1.97	5.27
Weed Control	109-111	2.38	2.61
Livestock Pests	111	0.20	1.80
Apiculture/Entomology	112	0.60	0.00
Totals		25.78	64.85

CEREALS AND OILSEEDS

Page 1

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PHY	TMY
Feed Grain Breeding - to develop high yielding adapted varieties of feed grains with emphasis on protein content and quality. Barley	2 Sites in Area 2 4 Sites in Area 3 3 Sites in Area 4 Saskatoon, Sask.	J. Helm D. Salmon F. Mederick	Field Crops A.R.C.	Ongoing. Reported Field Crops and Agricultural Research Council	1.25	11.25
Cereal & Oilseed Regional Variety Trials on barley, wheat, oats, flax and rapeseed	4 Sites in Area 1 8 Sites in Area 2 11 Sites in Area 3 13 Sites in Area 4	J. Helm D. Salmon B. Wolfe M. Kaufman K. Hay R. Gaudiel A. Kondra	Field Crops F.F.F. Agr. Canada Beaverlodge Lacombe Lethbridge A.H.R.C. U. of Alberta	Ongoing. Reported Cereal & Oilseed Advisory Committee, Field Crops and Agricultural Research Council	0.30	8.00
Agronomic research on high moisture grain production	Lacombe Olds	J. Helm D. Salmon F. Mederick	Field Crops	Ongoing. Reported Field Crops and Agricultural Research Council	0.40	2.00
Expansion of winter wheat, spring triticale and winter triticale	Lacombe Olds	J. Helm D. Salmon F. Mederick	Field Crops	Ongoing. Reported Field Crops and Agricultural Research Council	1.00	2.20
Winter triticale study	Vulcan Foremost	B. Roth	Field Crops	Year 2. Progress Report Circulated	0.05	0.10
Seed treatments for Bunt in Spring Wheat	Lethbridge Lethbridge Edmonton Fairview Saskatoon	K. Degenhardt L. Piening D. Degenhardt P. Ellis P. Verma	Ag. Canada U. of Alberta	Ongoing. Reported in Pesticide Research Report 1981	0.25	0.25
Cereal seed treatments	Fairview	P. Ellis	Reg Crops Lab	Ongoing. Reported in Pesticide Research Report 1981	0.05	0.10

CEREALS AND OILSEEDS (Continued)

Page 2

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PAY	TIME
Seed treatment in Fall Rye	Fairview Lethbridge	P. Ellis K. Degenhardt	Reg Crops Lab Agr. Canada Lethbridge	Ongoing	0.05	-
Fungicide seed treatments in Canola Insecticide seed treatments in Canola	Fairview Fairview Vegreville Olds	P. Ellis R. Butts H. Liu E. Mengerson	Reg Crops Lab Reg Crops Lab ABC Reg Crops Lab - Olds	Ongoing Ongoing	0.05 0.15	0.10 0.15
Sclerotinia Stem Rot Control in Canola	15 sites in Central Alberta	P. Thomas I. Evans J. Williams J. Dueck	Field Crops Pest Control U of A Agri. Canada	Ongoing - Reported to Expert Sub-Committee on Oilseeds and Special Crops and Chemical Control. Progress report circulated.	0.40	-

FORAGE CROPS

Page 3

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PHY	THY
Agronomic research and regional testing of forage crops	5 Sites in S. Alta. 4 Sites in C. Alta. Brooks, Monitor Longview, Standard Bow Island, Lacombe Camrose, Vermillion Lac La Biche	J. Helm L. Folkins R. Gaudiel	Field Crops F.F.F. A.H.R.C.	Ongoing. Reported Field Crops, A.H.R.C. and Agricultural Research Council	1.20	6.80
Annual forage crops for Alberta	Brooks, Bigstone Bow Island Standard, Longview +6 other locations in C. & N. Alberta	G. Riener R. Gaudiel B. Berkenkamp	F.F.F. A.H.R.C. Agr. Canada Lacombe	Ongoing A.H.R.C. Annual Report and A.H.R.C. Pamphlet 81-6	1.05	0.10
Alfalfa Breeding	Edmonton	P. Walton	U. of Alberta	Ongoing	0.05	0.45
Forage cultivar evaluation	Peace River District	R. Elliott M. Rudakewich	Agr. Canada Beaverlodge Field Crops	Ongoing	0.10	0.50
Alfalfa management	Peace River District	J. McKenzie M. Rudakewich	Agr. Canada Beaverlodge Field Crops	Completed Report Pending	0.10	0.50
Crop responses to Red Clover green manure plowdown	Peace River District	M. Rudakewich	Plant Industry	Initiated 1980-81	0.05	0.20
Effect of rainfall on forage quality	Westlock, Barrhead Onoway	E. Lowe L. Milligan	N.W. Region 5 U. of Alberta	Third year of three year project	0.30	0.02
Annual forage cultivar screening	Brooks Bow Island	G. Riener R. Gaudiel	F.F.F. A.H.R.C.	Began in Spring of 1980 Ongoing A.H.R.C. Annual Report 1981 and A.H.R.C. 82-6	0.33	0.33
Annual forage cultural practice improvement	Brooks	G. Riener R. Gaudiel	F.F.F. A.H.R.C.	Began in Spring of 1979 Ongoing A.H.R.C. Annual Report 1981 and A.H.R.C. 82-6	0.33	0.33

FORAGE CROPS (Continued)

Page 4

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMV
Annual forage crop adaptability project	Brooks Bow Island Standard Bigstone Longview	G. Riemer R. Gaudiel	F.F.F. A.H.R.C.	Began in 1979 Ongoing A.H.R.C. Annual Report 1981 and A.H.R.C. 82-6	0.34	0.34
Insecticide foliar sprays in alfalfa	Fairview	R. Butts	Reg Crops Lab	Ongoing	0.10	0.10
Effects of burning on alfalfa	Peace River	R. Butts P. Ellis	Reg Crops Lab	Ongoing	0.10	0.15
Alfalfa pest management	Peace River	R. Butts	Reg Crops Lab	Ongoing. Review 1983	1.00	1.00
Fungicide trials in alfalfa	Fairview	P. Ellis	Reg Crops Lab	Ongoing	0.10	0.10

SPECIAL CROPS

Page 5

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PHY	TMV
Fibre flax performance	Lacombe	J. Helm F. Mederick	Field Crops	Ongoing. Reported Cereal & Oilseed Advisory Comm., & Flax Growers of W. Canada	0.15	0.25
Field trial agronomic research in special crops production	Olds, Three Hills Calmar, Camrose Vermilion	J. Helm F. Mederick	Field Crops	Ongoing. Reported Field Crops, Alta. Pulse Comm., Special Crops Advisory Comm., Agricultural Research Council	1.30	3.00
Agronomic studies on corn	Seven Persons Burdett, Scandia Lethbridge Warner, Foremost	B. Roth D. Major	Field Crops Agr. Canada Lethbridge	Year 2 Progress Report Circulated	0.25	0.30
Agronomic studies on sunflowers	Bow Island	B. Roth R. Gaudiel	Field Crops A.H.R.C.	Year 2 Progress Report Circulated	0.15	0.25
Pulse crop inoculation trials	Barnwell Grassy Lake Bow Island	B. Roth R. McKenzie R. Rennie G. Kemp S. Dubetz H. Meunier	Field Crops Soils Agr. Canada Lethbridge	Year 1	0.10	0.20
Field bean cultivar and cultural trials	Brooks Bow Island	R. Gaudiel	A.H.R.C.	Active A.H.R.C. Annual Report 1981 Alberta Pulse Committee 1981	0.20	0.35
New crop cultivar, cultural and adaptation trials	Brooks Bow Island Standard	R. Gaudiel	A.H.R.C.	Active A.H.R.C. Annual Report 1981 Special Crops Committee 1981	0.40	0.60
Herbs and spices cultural and adaptability	Brooks	R. Gaudiel	A.H.R.C.	Active A.H.R.C. Annual Report 1981	0.05	0.05

SPECIAL CROPS (Continued)

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PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMV
Corn and sorghum cultivar and cultural	Brooks Bow Island	R. Gaudiel G. Riemer	A.H.R.C. F.F.F.	Active A.H.R.C. Annual Report 1981 Alberta Corn Committee 1981 Forage Crops Advisory Comm.	0.20 0.10	0.10
Diseases of field and special crops	Brooks	R. Howard R. Gaudiel K. Degenhardt	A.H.R.C. Agr. Canada Lethbridge	Ongoing A.H.R.C. Annual Report 1981 E.C.P.U.A. Pesticide Research Report 1981	0.05	0.05
Root diseases of pulse crops (F.F.F.)	Brooks S. Alberta	R. Howard G. Flores S. Sumar J. Carson	A.H.R.C. F.F.F. A.S.F.T.L.	Ongoing and new trials A.H.R.C. Annual Report 1981 E.C.P.U.A. Pesticide Research Report 1981 C.H.C. Report 1981 Alta. Pulse Crop Adv. Comm. Proc. Can. Phytopath. Soc. Expert Comm. Grain Diseases Plant Path. Soc. Alberta A.H.R.C. Pamphlet 82-5	1.10	0.05

ORNAMENTALS, TREES AND SHELTERBELTS

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PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PHY	THY
Woody ornamentals	Brooks	B. Casement	A.H.R.C. W.C.S.H. P.F.R.A. Nurseries Agr. Canada Horden	Active. Report to W.C.S.H. A.H.R.C. Annual Report 1981	0.34	1.00
Annual and perennial flowers	Brooks	B. Casement	A.H.R.C. All America Selections	Active. Report to A.A.S. and Seed Companies A.H.R.C. Summary Report 82-9 A.H.R.C. Annual Report 1981	0.21	0.65
Nursery production of woody ornamentals	Brooks	B. Casement	A.H.R.C.	Active A.H.R.C. Annual Report 1981	0.30	0.70
Overwintering trials of containerized nursery stock	Oliver	H. Oosterhuis C. McIsaac F. Straka	A.T.N. & H.C.	New and Ongoing	0.10	0.15
Monitoring container stock - transplants	Oliver	H. Oosterhuis	A.T.N. & H.C.	Ongoing	0.05	0.10
Monitoring of transplanted container grown evergreens	Oliver	H. Oosterhuis F. Straka	A.T.N. & H.C.	Ongoing	0.05	0.10
Seeding trial	Oliver	H. Oosterhuis	A.T.N. & H.C.	Ongoing	0.05	0.10
Saskatoon hardwood and softwood cuttings	Oliver	H. Oosterhuis G. Grainger	A.T.N. & H.C.	Ongoing	0.10	0.30
Storage and germination of burr oak acorns	Oliver	H. Oosterhuis F. Straka	A.T.N. & H.C.	Ongoing	0.05	0.10
Fertilizer amendments to potting mixes	Oliver	H. Oosterhuis F. Straka	A.T.N. & H.C.	Ongoing	0.05	0.10

ORNAMENTALS, TREES AND SHELTERBELTS (Continued)

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PHY	TMV
To study specific needs for improved germination of native plant material stratification needs INV 8	Oliver	G. Grainger	A.T.N. & H.C.	Ongoing	0.05	0.10
Overcoming Saskatoon dormancy INV 24	Oliver	G. Grainger	A.T.N. & H.C.	Completed. File #INV 24	0.05	0.08
Monitoring container stock - transplants	Oliver	H. Oosterhuis	A.T.N. & H.C.	Ongoing	0.03	0.06
Softwood cuttings - Saskatoon dormancy test INV 32	Oliver	G. Grainger	A.T.N. & H.C.	Ongoing	0.05	0.08
Seed propagation testing native species INV 30	Oliver	G. Grainger P. King	A.T.N. & H.C. E.N.R.	Active	0.10	0.20
Container stock media test INV 28	Oliver	G. Grainger	A.T.N. & H.C.	Active	0.05	0.10
Diseases of ornamental plants and shelter-belt trees	Brooks	R. Howard B. Casement	A.H.R.C.	Ongoing Not reported in 1981	0.01	0.02
Handling and Storage of nursery stocks	Brooks Oliver Lacombe Strathmore Coaldale	T. Krahn	A.H.R.C.	Active A.H.R.C. Annual Report 1981	0.15	0.10

FRUIT CROPS

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PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PHY	THY
Processing and quality evaluation of fruit	Brooks	G. Mazza	A.H.R.C.	Active A.H.R.C. Annual Report 1981	0.02	0.10
Native fruit utilization	Brooks	G. Mazza	A.H.R.C.	C.H.C. Research Report 1981 J. Food Sci. 1982	0.02	0.05
Bush and native fruit culture and cultivar improvement	Brooks	S. Mahadeva	A.H.R.C.	Active A.H.R.C. Annual Report 1981	0.20	0.60
Tree fruit culture and cultivar improvement	Brooks	S. Mahadeva	A.H.R.C.	Active A.H.R.C. Annual Report 1981	0.05	0.40
Conservation bundle production	Brooks	S. Mahadeva	A.H.R.C.	Active and Ongoing	0.05	0.25
Native fruit pilot project	Sexsmith Manning Fairview	S. Mahadeva L. Spangelo G. Grainger	A.H.R.C. Agr. Canada Beaverlodge A.T.N. & H.C.	Active A.H.R.C. Annual Report 1981	0.05	-

VEGETABLES AND POTATOES

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PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PHY	THY
Processing and quality evaluation of vegetables	Brooks	G. Mazza	A.H.R.C.	Active A.H.R.C. Annual Report 1981	0.10	0.10
Concentration studies of Alberta vegetables	Brooks	G. Mazza	A.H.R.C.	Active. Progress Reports J. Food Technol., 16 (1) 1981 A.H.R.C. Annual Report 1981 C.H.C. Annual Report 1981	0.20	0.05
Handling and storage of vegetables	Brooks	T. Krahn	A.H.R.C.	A.H.R.C. Annual Report 1981	0.15	0.15
Vegetable cultivar and cultural trials	Edmonton Peace River	R. Trimmer	A.T.N. & H.C.	A.T.N. & H.C.	0.30	0.20
Bulb crops	Brooks	P. Ragan	A.H.R.C.	A.H.R.C. Annual Report 1981 A.H.R.C. Pamphlet 82-8	0.20	0.30
Solanaceous vegetable trials	Brooks	L. Hausher P. Ragan	A.H.R.C.	A.H.R.C. Annual Report 1981 A.H.R.C. Pamphlet 82-8	0.01	0.20
Vegetable mulch and tunnel trials	Brooks	L. Hausher	A.H.R.C.	A.H.R.C. Annual Report 1981 A.H.R.C. Pamphlet 82-8	0.25	0.40
Vine crop cultivar and cultural trials	Brooks	L. Hausher	A.H.R.C.	A.H.R.C. Annual Report 1981 A.H.R.C. Pamphlet 82-8	0.20	0.50
Cole crop cultural and cultivar trials	Brooks	P. Ragan	A.H.R.C.	A.H.R.C. Annual Report 1981 A.H.R.C. Pamphlet 82-8	0.20	0.25
Pea and bean cultural and cultivar trials	Brooks	P. Ragan	A.H.R.C.	A.H.R.C. Annual Report 1981 A.H.R.C. Pamphlet 82-8	0.25	0.25
Sweet corn cultivar trials	Brooks	P. Ragan	A.H.R.C.	A.H.R.C. Annual Report 1981 A.H.R.C. Pamphlet 82-8	0.05	0.05
Root Crop cultivar and cultural trials	Brooks	P. Ragan	A.H.R.C.	A.H.R.C. Annual Report 1981 A.H.R.C. Pamphlet 82-8	0.02	0.05

VEGETABLES AND POTATOES (Continued)

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PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PHY	TMV
Diseases of vegetables	Brooks	R. Howard P. Ragan	A.H.R.C.	Ongoing A.H.R.C. Annual Report 1981	0.01	0.01
Processing and quality of potatoes	Brooks	G. Mazza S. Molnar	A.H.R.C. Partial fund- ing - Alberta Potato Com- mission	Active. Progress Reports Proc. Prairie Potato Council Annual Meeting 1981 Annual Meeting Potato Asso- ciation of America 1981 Can. Inst. Food Sci. and Technol. 1982 Am. Potato J. 58(1) 1981	0.66	1.70
Handling and storage of potatoes	Brooks	R. Krahn	A.H.R.C.	Active A.H.R.C. Annual Report 1981 C.H.C. Research Report 1981	0.25	0.20
Potato cultivar improvement	Brooks Grande Prairie	S. Molnar R. Howard G. Mazza D. Lynch	A.H.R.C. Agr. Canada Lethbridge	Active. Several types of trials A.H.R.C. Annual Report 1981 1981 Progress Report to Prairie Regional Potato Trial Group. National Potato Breeding Report 1981 (U.S.A.)	0.35	0.95
Potato production research	Brooks	S. Molnar	A.H.R.C.	Active. Several cultural trials under one heading A.H.R.C. Annual Report 1981 A.H.R.C. Pamphlet 82-10	0.25	1.00
Diseases of potatoes	Brooks	R. Howard S. Molnar D. Lynch	A.H.R.C. Agr. Canada Lethbridge	Ongoing A.H.R.C. Annual Report 1981 A.H.R.C. Pamphlet 81-18	0.10	0.10

GREENHOUSE CROPS AND GREENHOUSE ENERGY

Page 12

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	THY
Culture of greenhouse vegetable crops	Brooks	R. Mohyuddin	A.H.R.C.	Active. Several trials	0.25	0.60
Culture of greenhouse floriculture and foliage crops	Brooks	M. Mohyuddin	A.H.R.C.	Active. Several trials	0.20	0.80
Evaluation of hydroponic systems for growing greenhouse crops	Brooks	M. Mohyuddin	A.H.R.C.	Active	0.05	0.60
Diseases of greenhouse crops (F.F.F.)	Brooks Redcliff Medicine Hat	R. Howard M. Mohyuddin P. Kharbada	A.H.R.C. A.E.C. Vegreville	Ongoing and new trials A.H.R.C. Annual Report 1981 E.C.P.U.A. Pesticide Research Report 1981 Fungicide and Nematicide Tests 1981. C.H.C. Report 1981 Proc. Can. Phytopath. Soc. Plant Path. Soc. Alberta	1.10	1.00
Greenhouse energy conservation	Various	C. Schaupmeyer	A.H.R.C.	A.H.R.C. Annual Report 1981	0.50	-
Reject Heat for Greenhouse Heating	Various	C. Schaupmeyer	A.H.R.C.	A.H.R.C. Annual Report 1981	0.05	-

SOIL MANAGEMENT - FERTILIZERS - ANALYSIS

PROJECT TRIAL	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMV
Compilation and evaluation of Alberta soil data for crop production - provincial part of Canadian CANSIS program	Alberta	J. Carson L. Kryzanowski	Soils Branch Soil-Feed Lab	Active. Continue 1981 Progress report submitted annually	0.04	0.10
Comparison of total 5 levels in farm soils located at various distances from SO ₂ sources	Edmonton	D. Lavery J. Carson	Soil-Feed Lab	To be continued in 1982 Low priority	0.01	0.05
Minor element analysis by Plasma Emission Spectroscopy - Stage 1 - Equipment installation and standardization - Stage 2 - Collection of plant species and soils for analysis	Edmonton	J. Carson D. Lavery	Soils Branch Soil-Feed Lab	Step 1 completed Active. Data being collected, summarized and reported annually	0.02	0.40
Making the most of nitrogen	Alberta	D. Lavery A. Henning D. Penny D. Walker J. Harapiak	Soils Branch Soil-Feed Lab	Active Data being summarized for first 3 years	0.50	1.50
Deep plowing of solonchic soils - chemical aspects	Alberta, mainly S.E. of Edmonton	J. Hermans J. Carson	Soils Branch Soil-Feed Lab	Initiated 1977 Progress Report 1981 Continued 1982	0.20	0.50
Assessment of ripping (24") and liming as a method of reclaiming solonchic soils	Alberta, mainly S.E. of Edmonton	J. Hermans	Soils Branch	Initiated 1978 Progress Report 1981 Continued 1982	0.05	0.10
Assessment of deep plowing and tile drainage on a solonchic soil under irrigation	W. of Strathmore	J. Hermans B. Peterson	Soils Branch Irrigation Division	Initiated 1977 Progress Report 1981 Continued 1982	0.05	0.02
Snow trapping with stubble barriers to increase soil moisture	Region II	D. Chanasyk C. Gietz J. Hermans	U. of Alberta Soils Branch	Initiated 1982	0.05	0.10

SOIL MANAGEMENT - FERTILIZERS - ANALYSIS (Continued)

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PMY	TMV
Hydrologic model for soil/land management in the Peace River region	Peace Region	D. Chanasyk E. Rapp P. Crown J. Hermans C. Gietz	U. of Alberta Soils Branch	Initiated 1980 Progress Report 1981 Continued 1982	0.20	1.00
Dryland saline seep subsurface drainage evaluation	Gratum Coutts	H. Vander Pluym	Soils Branch	Progress Report 1980 Ongoing	0.10	0.50
Fertilizer requirement of irrigated soft wheat	4 locations in s. Alberta	H. Vander Pluym	Soils Branch	Progress Reports each year In 1982 taken over by R. McKenzie	0.10	0.30
Salt tolerance determination of types and varieties of grasses	New Dayton Nobleford	H. Vander Pluym	Soils Branch	Ongoing	0.05	0.10
Sprigging trials of salt tolerant grasses	Lethbridge	H. Vander Pluym	Soils Branch	Ongoing	0.10	0.10
Development of subsurface drainage design standards for Alberta	S. Alberta	M. Eoroud H. Vander Pluym	F.F.F. Soils Branch	Initiated 1981 Progress Report 1981	0.50	0.50

WEED CONTROL

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PHY	THY
Herbicide trials and evaluations INV 37, 38, 39, 40	Oliver	G. Grainger	A.T.N. & H.C.	Ongoing	0.05	0.15
Weed control in pulses, sunflowers and spices	Brooks Bow Island	R. Esau	A.H.R.C.	Active A.H.R.C. Annual Report 1981 Expert Committee on Weeds	0.25	0.25
Chemical weed control for nursery crops and shelterbelts	Brooks	R. Esau	A.H.R.C.	Active A.H.R.C. Annual Report 1981 Expert Committee on Weeds	0.20	0.15
Chemical weed control in small and native fruit	Brooks	R. Esau	A.H.R.C.	Active	0.01	0.02
Weed control in vegetable crops	Brooks	R. Esau	A.H.R.C.	Active A.H.R.C. Annual Report 1981 Expert Committee on Weeds Can. Hort. Council	0.25	0.30
Weed control in potatoes	Brooks	R. Esau	A.H.R.C.	Active A.H.R.C. Annual Report 1981 Expert Committee on Weeds	0.21	0.23
Application of herbicides through sprinkler systems	Brooks	R. Esau	A.H.R.C.	Inactive in 1981	-	-
Herbicide residues in crop rotation	Brooks Olds	R. Esau F. Leavitt	A.H.R.C. Weed Branch	Active. To be phased out A.H.R.C. Annual Report 1981 Expert Committee on Weeds	0.10	0.05
Screening trials of herbicides for production of coniferous plants	Oliver	H. Oosterhuis F. Straka	A.T.N. & H.C.	New and Ongoing	0.05	0.10
Screening trials of herbicides for newly seeded deciduous stock	Oliver	H. Oosterhuis F. Straka	A.T.N. & H.C.	New and Ongoing	0.05	0.05

WEED CONTROL (Continued)

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PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PHY	THY
Weed control trial and demonstration opportunities	Province-wide	F. Leavitt	Weed Branch	Ongoing	0.40	0.50
Control of Canada thistle on summerfallow fall application	Province-wide	F. Leavitt D. Cole	Weed Branch	Active Complete. Report Available	0.10	0.20
The effect of wild oat herbicide and selected broad leaf herbicides on potential cereal varieties	Lacombe	F. Leavitt J. Helm	Weed Branch Field Crops	Established 1982	0.15	0.10
Herbicide screening trials on newly introduced weeds (Knapel, B. L. Pepper Grass, Field Scabious)	Athabasca	F. Leavitt D. Cole A.S.B.'s	Weed Branch	Ongoing Annual Reports to Expert Committee on Weeds	0.25	0.75
The effect of zero-tillage on the type and density of weeds present (on-farm counts)	Province-wide 14 locations	F. Leavitt	Weed Branch	Ongoing Report circulated provincially	0.01	0.04
Weed Control in cereal crops - an examination of cultural control alternatives (Applied)	3 sites within the province To be assigned within 30 days	F. Leavitt D. Cole	Weed Branch	One year project	0.10	0.10
Control of brush using aerially applied picloram and dicamba	Pincher Creek Raymond Oyen Provost, Leduc High Prairie Evansburg Lac La Biche	A. Stearman	Weed Branch	Initiated 1979. In 1981 observations on control, residues, cost estimates. Continue in 1982 to assess brush control, grass regrowth	0.10	0.20
Brush control and pasture renovation	HD of Bonnyville	A. Stearman F. Leavitt	Weed Branch	Initiated 1975-1976 Reported. ECW (Western) 1979- and P.I.D. Annual Report 1979. Complete final observations in 1982 - brush control, grass regrowth and soil carryover of herbicide	0.10	0.10

WEED CONTROL (Continued)

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PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PHY	THY
Brush control and pasture renovation	County of Athabasca	A. Stearman F. Leavitt	Weed Branch	Initiated 1978. Reported P.I.D. Annual Report 1979 Assess effects of clearance and reseeding. Assess cost of work completed		0.10

LIVESTOCK PESTS

PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PHY	THY
Protection of cattle from biting fly attack using insecticides	Athabasca	J. Shemanchuk	Agr. Canada Lethbridge partial funding by F.F.F.	Ongoing	0.10	1.50
Evaluation of resistance to blackfly attack among various breeds of cattle	Athabasca	J. Shemanchuk	Agr. Canada Lethbridge partial funding by F.F.F.	Ongoing	0.10	0.30

APICULTURE/ENTOMOLOGY

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PROJECT TITLE	TRIAL LOCATION	RESEARCHERS	AGENCY	STATUS AND REPORTED	PHY	THY
Honeybee management	Brooks, Scandia	U. Soehngen	A.H.R.C.	Active A.H.R.C. Annual Report 1981	0.40	-
Alfalfa leafcutter management	Brooks	U. Soehngen	A.H.R.C.	Active A.H.R.C. Annual Report 1981	0.05	-
Insect Pests of Horticultural Crops	Brooks	U. Soehngen	A.H.R.C.	Terminated A.H.R.C. Annual Report 1981	0.05	-
Control of Insects in greenhouse crops	Redcliff	U. Soehngen	A.H.R.C.	Active A.H.R.C. Annual Report 1981	0.10	-

VII. PUBLICATIONS AND PAPERS

FIELD CROPS BRANCH

- Fact sheets on peas, beans, fababeans, lentils
- Reprinted: Forage Production Manual
- Co-ordinated Preparation of the Forage Home Study Course; 10 lessons
- Alfalfa Production and Leafcutter Bee Production newsletters
- Fact sheet on use of potassium carbonate for drying of hay
- Silage Production
- Corn Production Manual
- Trade contracting of Special Crops in Southern Alberta
- Fact sheet on recommended varieties of forages for Alberta
- 1981 Seed for Cereal Crops in Alberta
- Seed Plant - Seed Analysis Program
- Control of Sclerotinia Stem Rot in Canola
- Merits of Certified Seed of Forages and Legumes
- Sunflower Production in Southern Alberta
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- Cleavers control in barley
- Yellow-flowered hemp-nettle control in barley
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- Winter wheat tolerance to fall applied herbicides
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HORTICULTURE

ALBERTA TREE NURSERY AND HORTICULTURE CENTER

Publications and Papers

Alberta Tree Nursery & Horticulture Center - Annual Report
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- Differences in root rot resistance in processing bean cultivars, G. Flores and R.J. Howard
- Resistance of dry bean cultivars to Fusarium root rot, G. Flores and R.J. Howard
- Root rot of processing peas and beans in southern Alberta in 1981, G. Flores and R.J. Howard
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- Watermelon polyethylene mulch and tunnel trial - L. Hausher
- Control of root-knot nematodes of greenhouse cucumbers and tomatoes with Mocap, P.D. Kharbanda and R.J. Howard
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- Rutabaga quality as affected by storage period, T.R. Krahn
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- Some effects of phosphorous fertilizer on currants, S. Mahadeva
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- Mazza, G. 1981. 'Dehydration of Carrots: Effects of Predrying Treatments on Moisture Transport and Product Quality'. Presented at the 24th Annual Conference of the Canadian Institute of Food Science and Technology, Winnipeg, paper #45.
- Mazza, G. 1981. 'Sucrose Content of Potatoes as Affected by Cultivar, Production and Storage Practices'. Presented at the 65th Annual Meeting of the Potato Association of America, Charlottetown, P.E.I. Abstract in American Potato Journal, 58, 511.
- Mohyuddin, M. 1981. 'Impressions of a Visit to Greenhouses in England and Holland'. Presented at the Plant Pathology Society of Alberta Meeting, Vegreville, Alberta. September.
- Moskaluk, E.R. and R.J. Howard. 1981. 'Verticillium Wilt of Alfalfa in Southern Alberta'. Presented at the Annual Meeting of the Pest Control Advisory Committee, Edmonton. September.
- Sumar, S.P. and R.J. Howard. 1981. 'Chemical Control of Root Rot in Dry and Processing Beans'. Presented at the Annual Meeting of the Expert Committee on Grain Diseases, Edmonton. February.
- Sumar, S.P. and R.J. Howard. 1981. 'Fusarium Root Rot of Processing Peas and Beans in Alberta'. Presented at the Annual Meeting of the Canadian Phytopathological Society, Ottawa. June.

- Traquair, J.A., E.R. Moskaluk and R.J. Howard. 1981. 'Update of Verticillium Wilt of Alfalfa in 1981'. Presented at the Annual Meeting of the Plant Pathology Society of Alberta, Vegreville. September.
- Presented at Growers and Agri-business Meetings.
- Casement, E.B. 1981. 'New Varieties of Annual Flowers'. Presented to the Bedding Plant Course at Olds. January.
- Casement, E.B. 1981. 'Starting a Nursery'. Presented to Nurserymen's Short Course at Oliver. February.
- Casement, E.B. 1981. 'New and Old Varieties of Trees, Shrubs and Flowers'. Presented to the South Alberta Turfgrass Association, Calgary. April.
- Esau, R. 1981. 'Weed Control in Vegetable Crops'. Presented at Market Garden Short Course, Edmonton and Calgary. January.
- Gaudiol, R. 1981. 'Zinc Deficiency and Fertilization in Dry Beans'. Presented at the Alberta Wheat Pool Bean Plant Seminar. February.
- Hausher, L.G. 1981. 'Lengthening the Vegetable Production Season'. Presented at the Direct Marketing Conference, Fresno, California. February.
- Hausher, L.G. and P. Ragan. 1981. Sixth Annual Market Garden Short Course, Edmonton and Calgary. January.
- Hausher, L.G. 1981. 'The Market Garden Program in Alberta'. Presented at the Fresh Vegetable Marketing Board Annual Meeting. November.
- Howard, R.J. 1981. 'The 1981 Alberta Potato Seed Lot Trial'. Presented at the Annual Meeting of the Alberta Seed Potato Growers' Association, Lethbridge. November.
- Howard, R.J. 1981. 'Grower the Healthy Spud'. Presented at the Annual Meeting of the Alberta Potato Growers' Association, Lethbridge. November.
- Howard, R.J. 1981. 'Diseases of Greenhouse Tomatoes and Their Control'. Presented at the Greenhouse Tomato Production Short Course, Brooks. November.
- Howard, R.J. 1981. 'Diseases of Alfalfa in Southern Alberta'. Presented at the Forage Home Study Orientation Course, Brooks. December.
- Howard, R.J. 1981. 'Bedding Plant Diseases and Their Control'. Presented at the Olds College Bedding Plant Course, Olds. January.
- Howard, R.J. 1981. 'White Mold of Dry Beans and Its Control'. Presented at the Dry Bean Growers' Seminar, Bow Island. February.

- Howard, R.J. 1981. 'Bacterial Ring Rot and Other Major Potato Diseases in Southern Alberta'. Presented at the Potato Inspectors' Seminar, Brooks. August.
- Kharbanda, P.D. 'Diseases of Greenhouse Lettuce'. Presented at the Greenhouse Lettuce Open House, Brooks. July.
- Krahn, T.R. 1981. 'Metrics and Farming'. Presented at the Annual Meeting of the Alberta Potato Commission and the Alberta Fresh Vegetable Marketing Board, Lethbridge. November.
- Krahn, T.R. 1981. 'Apiculture Research Program at A.H.R.C.'. Presented at the Annual Meeting of the Alberta Beekeepers Association, Calgary. November.
- Mahadeva, S. 1981. 'Selection, Planting and Maintenance of Fruit Orchard'. Presented at Medicine Hat Horticultural Society. November.
- Mohyuddin, M. 1981. 'Water and Nutrition Management of Bedding Plants'. Presented at the 5th Annual Bedding Plants Course, Olds College, Olds. January.
- Mohyuddin, M. 1981. 'Impressions of a Visit to Greenhouses in England and Holland'. Presented at the 17th Annual Hort. Week, Olds College, Olds. August.
- Mohyuddin, M. 1981. 'Impressions of a Visit to Greenhouses in England and Holland'. Presented at the Annual Meeting of the Hydroponic Coop, Welling. September.
- Rierner, G.E. 1981. 'Annual Forages in the Special Area'. Presented to the Annual Meeting of the Chinook Applied Research Association, Youngstown. March.
- Rierner, G.E. 1981. 'What's New in Annual Forages'. Presented at the Foothills Forage Association Annual Seminar Session, Airdrie. April.
- Rierner, G.E. 1981. 'Annual Forages in the Special Area'. Presented to the Preliminary Training Session for the Alberta Forage Home Study Course, Brooks. December.
- Schaupmeyer, C.A. 1981. 'The Production of Vegetable Bedding Plants'. Presented at the 5th Annual Bedding Plant Course, Olds College, Olds.
- Schaupmeyer, C.A. 1981. 'Energy Conservation in Greenhouses'. Presented at the 5th Annual Bedding Plant Course, Olds College, Olds.
- Schaupmeyer, C.A. 1981. 'Energy Conservation in Greenhouses'. Presented to the Alberta Greenhouse Growers' Association, Banff.

Schaupmeyer, C.A. 1981. 'Planning and Planting a Rural Vegetable Garden'. Presented to the Annual meeting of the Canadian Seed Growers' Association.

Soehngen, U. 1981. 'Anatomy and Physiology of the Honeybees'. Presented at the Beekeeper's Short Course, Olds College, Olds.

Soehngen, U. 1981. 'Disease of the Alfalfa Leafcutter Bee, *Megachile rotundata*'. Presented at the Leafcutter and Alfalfa Seed Production Short Course, Olds College, Olds.

Soehngen, U. 1981. 'Control of Greenhouse Insects'. Presented at the Greenhouse Pesticide Applicators Course, Edmonton.

Newsletters

Casement, E.B. 1981. 'Prairie Landscape'. Regular contributions.

Hausher, L.G. 1981. 'Market Garden Newsletter'. Alberta Horticultural Research Center. Issued monthly.

Howard, R.J., R. Esau and U. Soehngen. 1981. 'Crop Protection Newsletter'. Vol. 5, Nos. 1-12. Issued monthly. Alberta Horticultural Research Center.

Mohyuddin, M. 1981. 'Alberta Greenhouse Newsletter'. Alberta Horticultural Research Center. Issued monthly.

Honors and Awards

Molnar, Stevan A. The Distinguished Agrologist Award from the Alberta Institute of Agrologists. June 19, 1981.

VIII. SHOW WINNERS

Royal Agricultural Winter Fair

The Royal Agricultural Winter Fair was held in Toronto in November, 1981.

Class 706 : Pedigreed Barley, 2 rowed variety

1. Lanny and Wallace Holmen - Box 12, Wayne, Alberta
3. Frank Kastelic - Sangudo, Alberta

Class 710 : Pedigreed Flax

5. Frank Kastelic - Sangudo, Alberta

Class 712 : Pedigreed Hard Red Spring Wheat

3. Frank and Shirley Davidson - Box 213, Morrin, Alberta
4. Frank and Shirley Davidson - Box 213, Morrin, Alberta
6. Stan Lavalley - SS1-3-38, Lethbridge, Alberta
7. John Holmen - Box 12, Wayne, Alberta
8. Willard Penner Seeds Ltd. - Box 668, Grassy Lake, Alberta

Class 715 : Pedigreed Durum Wheat

1. Stan Lavalley - Lethbridge, Alberta

Class 716 : Pedigreed Alfalfa Seed

1. James F. Burton - R.R. #1, Tilley, Alberta
2. Jorgen Larsen - Box 128, Tilley, Alberta
3. Elmer Larsen - Box 59, Tilley, Alberta
4. Dennis Petersen - Tilley, Alberta

Class 718 : Pedigreed Brome Grass

1. William Holst - Box 149, Hines Creek, Alberta
2. W.B. Fulton - Rockyford, Alberta

Class 719 : Pedigreed Fescue

3. Sig Arnot - High Prairie, Alberta

Class 722 : Pedigreed Timothy Seed

2. Ernest Kvarnberg - R.R. #3, Calmar, Alberta

Class 725 : Pedigreed Any Other Species of Forage Legumes

1. George Nicholls - Debolt, Alberta
2. Marcel Maissoneuve - McLennan, Alberta

Class 800 : Barley, 2 Rowed

3. Mr. and Mrs. Chris Deurloo - Box 7, Granum, Alberta

Class 807 : Flax, Linseed Type

3. Mr. and Mrs. Chris Deurloo - Box 7, Granum, Alberta

Class 816 : Wheat, Hard Red or White Spring

2. Robert M. Luco - Box 514, Lethbridge, Alberta
4. Edward Boyko - Box 154, Sangudo, Alberta
6. Mr. and Mrs. Chris Deurloo - Box 7, Granum, Alberta
9. Lenard Cunningham - Kelsey, Alberta

Class 820 : Wheat, Durum

1. Mr. and Mrs. Chris Deurloo - Box 7, Granum, Alberta
4. Robert M. Luco - Box 514, Lethbridge, Alberta

Class 822 : Brassica, Rapeseed, Canola, Kale, Turnip or Mustard Seed

2. Mr. and Mrs. Chris Deurloo - Box 7, Granum, Alberta
3. Lenard Cunningham - Kelsey, Alberta
4. Edward Boyko - Box 154, Sangudo, Alberta
5. Frank Kastelic - Sangudo, Alberta

FORAGE CROPS AND SHEAVES

Class 835 : Hay, 2nd Cut, 85% or More Legume

1. Lawrence Watmough - Box 492, Lethbridge, Alberta
3. Ronny Hilgersen - Box 1082, Coaldale, Alberta
4. Gerry Hilgersen - Box 1082, Coaldale, Alberta

WORLD CHAMPIONS - FIELD CROPS

Barley : Variety - Klages

Lanny and Wallace Holmen - Box 12, Wayne, Alberta

Hay

Lawrence Watmough - Box 492, Lethbridge, Alberta

PEDIGREED SEED - CANADIAN SEED GROWERS' ASSOCIATION TROPHY

Class 706 : Klages

Lanny and Wallace Holmen, Box 12, Wayne, Alberta

Barley, 2 rowed

Champion : Klages Variety

Lanny and Wallace Holmen, Box 12, Wayne, Alberta

Field Crop Judge : Rapeseed/Canola, Bassica, and Forage Crop Seeds

Mr. D.A. Cooper - Lacombe, Alberta

